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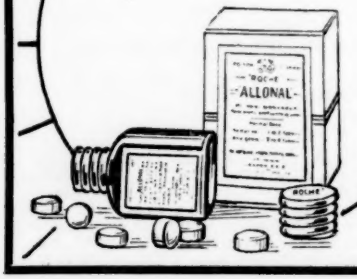

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CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT.

ST. CYRES LECTURE on Heart and Circulation in a Tropical Avitaminosis (Beri-Beri). By Prof. K. F. WENCKEBACH, F.R.C.P..... 265

ORIGINAL ARTICLES.

The Later Results of Partial Gastrectomy. By NORMAN C. LAKE, F.R.C.S.—(*Illustrated*) .. 268

The Standardisation of Scarlet Fever Antitoxin. by Clinical Methods. By ROBERT CRUICKSHANK, M.D. 274

Ætiology of Hyperpiesis in Egyptians. By ABD-EL-AZIZ ISMAIL, M.R.C.P. 275

CLINICAL AND LABORATORY NOTES.

Blood Changes Associated with Liver Diet in Young Convalescents. By K. SHIRLEY SMITH, M.R.C.P., and L. E. H. WHITBY, M.R.C.P. 277

A Comparison of the "Titanium Ray" with the Metallic Tungsten Arc. By B. D. H. WATTERS, M.Sc.—(*Illustrated*) 278

Abscess of the Heart causing Death through Coronary Hæmorrhage. By FRANCIS MCLAGAN, M.B. 279

REVIEWS AND NOTICES OF BOOKS.

The Prescribing of Spectacles. By A. Stanley Percival, M.B. 282

Beiträge zur Kenntnis der Beckenbrüche und Beckenluxationen. By Anders Westerborn 282

Syphilis. By Prof. Henry H. Hazen, M.D..... 283

Deafness and its Alleviation. By Major Vincent Nesfield, F.R.C.S..... 283

Lehrbuch der Unfallheilkunde. By Dr. Paul Jottkowitz 284

Diseases of the Blood and Blood-building Organs. By Prof. W. P. Lucas, M.D., and Alfred H. Washburn, M.D..... 284

LEADING ARTICLES.

THE INTERNATIONAL UNIT OF X RAYS 285

DISSOCIATED JAUNDICE .. 285

ACTIONS AGAINST GOVERNMENT DEPARTMENTS.... 286

ANNOTATIONS.

The Diagnosis of Tubercle in General Practice 287

The Styptic Effect of Transfused Blood..... 288

Gall-bladder Disease in the Young 288

Ethylene in the Operating Theatre 289

Public Health Congress and Exhibition 289

Foot-and-Mouth Disease.. 289

Protection of Motherhood in Switzerland 290

Atmospheric Pollution.... 290

Synthalin in Diabetes 291

Harvest Bugs..... 291

Scarlet Fever Antitoxin .. 292

PUBLIC HEALTH SERVICES.

The Health of London in 1927: General Health Services.—School Medical Service 279

Mental Hospital Reports.. 281

Infectious Disease in England and Wales..... 282

THE SERVICES.

Royal Naval Medical Service.—Royal Army Medical Corps.—Indian Medical Service.—Colonial Medical Services 303

BRITISH MEDICAL ASSOCIATION.

Section of Surgery: Diagnosis and Treatment of Spinal Cord Tumours.—Treatment of Gangrene 292

Section of Pathology and Bacteriology: Bacterial Flora of the Intestine in Health and Chronic Disease 295

Section of Orthopædics: Low Backache and Sciatica. — Volkmann's Ischæmic Contracture .. 296

Exhibition of Drugs, Surgical Instruments, Foods, and Appliances 299

SPECIAL ARTICLES.

Berlin: Statistics of Venereal Disease 302

Medicine and the Law: Imprisonment for "Nature Cure Practitioner" 303

NEW INVENTIONS

Apparatus for Recording Human Blood Pressure. By J. H. THOMPSON, B.Sc.—(*Illustrated*) 284

CORRESPONDENCE.

Smooth and Rough Variants of Bacteria (Dr. J. A. Arkwright, F.R.S.) 304

The Hereditary and Constitutional Factor in Addison's (Pernicious) Anæmia (Dr. Arthur F. Hurst) 305

Instruction in Psychiatry (Dr. Estelle Cole) 305

Cancer and the Blood-Groups (Mr. Penrose Williams) 306

Home Production of Cocaine (Messrs. Burroughs Wellcome and Co.) 306

Sir Morell Mackenzie's Birthplace 314

PARLIAMENTARY INTELLIGENCE.

Notes on Current Topics: Health Administration in Scotland.—Ministry of Health Vote 306

MEDICAL NEWS.

Univ. of Oxford..... 310
Univ. of Cambridge 310
Roy. Coll. Surg. Eng. 310
Roy. Coll. Phys. Lond. and Surg. Eng..... 310
Western Ophthalmic Hospital, Marylebone..... 277
Donations and Bequests.. 304
Smoke Abatement Inquiry at Bradford 306
The late Dr. Heywood Smith 310
St. Bart.'s Hospital and College 311
Roy. Coll. Surg. Irel..... 311
Roy. Coll. Phys. Lond..... 311
St. Mary's Hospital Annual Dinner 311
Extension of Paignton Hospital 311
Central London Throat, Nose and Ear Hospital.. 311
Fellowship of Medicine and Post-Grad. Med. Assoc. 311
Private Patients at Norwich 312
Christmas Medical Tour on the Côte d'Azur..... 312
The late Dr. C. H. Newby 312
Rating of Lancashire Hospitals 312
The late Dr. D. P. Cooper 312
King George Hospital 312
The late Dr. J. W. Melville 312
Closing of War Hospitals.. 314

NOTES, COMMENTS, AND ABSTRACTS.

The Red Cross in Time of Peace 313
The International Handbook of Child Care and Protection 313
Nitrites in Sea-Sickness .. 314
A Handy Card-Index Clip 314
Animals and Reason..... 314
New Preparations: Citobaryum.—Shadoform .. 314
Active Treatment after Electrical Trauma..... 314

Medical Diary 312
Appointments—Vacancies. 312
Births, Marriages, Deaths 313

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ON

HEART AND CIRCULATION IN A TROPICAL AVITAMINOSIS (BERI-BERI).

Delivered at the National Hospital for Diseases of the Heart, London,

BY PROF. K. F. WENCKEBACH, M.D., F.R.C.P.

(From the First Medical Clinic, Vienna.)

FORTY years ago, as a young doctor in my own country, I was intimately acquainted with the two Dutch scientists, Pekelharing and Winkler, who, as a government committee, had studied beri-beri in the Dutch Indies. In those days nothing was known of its ætiology; my authorities believed it to be an infectious disease. Eykman and Grijns had not yet discovered its causation, but many of its clinical features had been described, and it was generally known that, to quote a British poet—

> "Beri-beri is very, very
> Hard on the nerves——,"

and, moreover, very "hard on the heart" also. I was greatly impressed by the astonishing facts that patients seem to die of complete failure of the right heart only; that the opinion (accepted as a dogma) was that this heart failure must be due to a degeneration of the vagus nerve; that patients may die 24 hours after having been in seemingly good health; that there was an "idiopathic" hypertrophy of the whole heart with evident lack of contractile strength as the chief characteristic; and that vitamin B had a miraculous effect on a heart which refused to react to any cardiac drugs—all these facts suggested to me the existence of some quite peculiar morbid process. Some seven years ago I explained this important problem to a young friend, Dr. Aalsmeer, a lecturer on internal medicine at the medical school for native doctors at Surabaya (Java). He devoted a good deal of time and interest to the question and last autumn returned from the Dutch Indies with complete clinical records of the cardiac aspect of the disease. These data, illustrated by X ray photographs and electrocardiograms, provide us with a veritable "natural history" of the circulatory apparatus in beri-beri cases.

CAUSE, SYMPTOMS, AND TREATMENT OF BERI-BERI IN GENERAL.

The generally acknowledged ætiology lies in the absence of an accessory food factor (vitamin B), contained in the bran of rice and cereals. The disease makes its appearance where polished rice is the exclusive diet. Proof of this pathogenesis is furnished by the results of the sole treatment—viz., addition to the diet of vitamin-containing foodstuff, such as rice-bran, bran extracts, or a certain bean, known in Japan for over ten centuries (*Phaseolus radiatus*. Malayan: katjang idjoe). Even in very severe cases it relieves the serious symptoms. The principal pathological changes are:—

(*a*) Degenerative processes in the peripheral nervous system, damaging and even destroying the peripheral motor and sensory, as well as the sympathetic and parasympathetic elements. The symptoms are those of extensive polyneuritis.

(*b*) Anasarca and serous effusion in the large cavities. In chronic cases there may be a condition of extreme general atrophy and dryness of skin and tissues, the so-called "dry form."

(*c*) Heart disease, characterised by general feebleness of the circulation, palpitations on the slightest exertion, swelling of the liver and œdema, with general swelling of the limbs. This heart failure is very often the cause of death.

CLINICAL ASPECTS OF HEART AND CIRCULATION.

I rely on the work of Aalsmeer, correlating it with the earlier work of Vedder, Castellani, Chambers, and Manson, in English; of Scheube, Nocht, and Mense in German; of the Dutch authors Pekelharing and Winkler, Kieviet de Jonge, de Langen; and the many Japanese contributions, culminating in the important work of Shimazono, whose conceptions are in many respects identical with those of my collaborator.

The following points may now be taken as well established:—

1. From the beginning of the disease the whole heart, right and left, is enlarged; X rays show not only an enlargement to the right, but also bulging of the left auricle in the so-called "taille" (left upper border) of the heart shadow. The left ventricle, too, is clearly larger than normal. It is impossible to decide whether, in this first period, the enlargement is due to dilatation alone or to hypertrophy of the muscle wall also.

2. This enlargement and corresponding failure of the heart increases more or less rapidly, sometimes in a few hours, *but chiefly involves the right heart.* The prevalence of right heart failure and right heart widening and hypertrophy is mentioned by everyone who has studied the disease at the bedside and post mortem. A remarkable clinical manifestation is the disappearance of the apex-beat and the substitution for it of a curious wriggling, fluttering motion of the heart muscle, which the patient himself feels and which is easily seen on inspection and felt by palpating with the whole palm of the hand.

3. Increasing stasis takes place in the liver and venæ cavæ, and in acute cases this causes an enormous, painful swelling and bulging of the liver, ascites, and sometimes sudden death.

4. Even in the most serious cases there is never any irregularity of the heart, no extrasystoles, flutter, or fibrillation. The electrocardiogram never shows any disturbance of stimulus conduction. The ventricular complex is perfectly normal, and the size of the different waves rather exaggerated, the only peculiarity being a certain degree of preponderance of the right ventricle.

5. The pulmonary circulation is completely free from any sign of stasis, œdema of the lungs only showing itself in the last moments before death. There is no other disease of the lungs, no true emphysema, no arterio-sclerosis or spasm of the pulmonary arteries, which might cause right heart failure.

6. Apart from variations in the course, dependent on the relative intensity of neuritic manifestations on the one hand and of cardiac disease on the other, two forms of beri-beri are generally recognised—namely, a chronic and an acute, so-called pernicious and usually fatal form. The latter is now much less often seen than it used to be, since specific treatment has almost abolished it.

7. The whole series of heart remedies and diuretics (digitalis, strophanthin, caffeine, theobromine, thyroid, novasurol, salyrgan, &c.) is of no real use for the beri-beri heart. Vitamin B alone is an immediate and usually complete success. At autopsy the heart shows enlargement of its cavities and apparent hypertrophy of its walls, both much more pronounced in the right side of the heart. Microscopically there are no striking changes in the heart muscle-fibres and no inflammation.

DILATATION AND FAILURE OF THE RIGHT HEART.

The first unsolved problem of the beri-beri heart is the extreme widening and failure of the right heart in contrast with the relative smallness of the left ventricle and the absence of pulmonary stasis. This seems the more enigmatic, as there is proof that both sides of the heart suffer at the beginning of the disease. The soft and frequent pulse, however, the curious wriggling motion of the enlarging heart, and the progressive over-filling of the proximal parts of the venous system (v. cavæ and liver), are undeniable signs of the heart's incapacity to convey the whole quantity of affluent blood from the

venous into the arterial side of the vascular system. Clinical experience has taught me *that in such cases of increasing insufficiency of the whole heart the right heart is doomed beforehand to suffer much more than the left, and even to suffer to the profit of the latter.* If the strength of systole is decreasing in both ventricles equally, the moment will come at which both ventricles will fail to discharge their contents completely. A larger amount of residual blood than normal is retained in the heart. This larger post-systolic ventricular blood volume, together with a normal onflow of blood during the diastole, must necessarily result in a greater filling of the heart at the beginning of the next systole. This increased load will soon become too much for a heart already unable to discharge a normal quantity of blood. The output will become smaller and smaller, the filling of the arteries will be less, and the diastolic filling of the heart and the venous stasis before the entrance port of the heart must both increase. This being so, two factors will establish a marked difference between the right and left heart.

The first of these is the anatomical inequality of the two ventricles, the right being of lighter build, and provided with a thinner wall. The tricuspid valves are implanted on a much weaker ground than the mitral; there is no strong fibrous ring supporting them, they are condemned to share the distension of the right ventricle, and consequently are more liable to incompetence. Once this incompetence is established, blood passes from the right heart backwards into the veins and liver and the arterial output of the right ventricle is greatly reduced.

A still more important factor is at work. In the blood stream, moving "quasi in circulo," the right heart is located higher up the river than the left. As a consequence, the right heart has to deal under all circumstances with the whole volume of blood returning from the periphery to the heart, *the left heart not receiving more blood than the right heart is able to transmit.* Consequently the right heart is all the time struggling for life against an ever-increasing overfilling and widening, but the left heart is spared a similar burden. *The more the right heart suffers and fails, the safer the left heart becomes,* working under easy conditions and decreasingly threatened by such factors as might lead to overfilling and dilatation.

In such circulatory disturbances, despite a smaller output of the left heart, this smaller minute volume will reach the great veins and the right heart in due time. This holds good even in severe degrees of mitral stenosis, in which an extremely high arterial blood pressure may be maintained. Even after the final standstill of the heart in the first moments of death this function of the arterial wall (perhaps the last of life) is maintained, so that post mortem the arteries are found empty and the venous system filled. Therefore a smaller supply of blood to the aortic system cannot be expected to relieve the difficulties of the right heart in the same way as a smaller supply to the pulmonary arteries relieves the left heart.

These explanations make it possible to understand the cardiac and circulatory phenomena of beri-beri, the initial widening of the whole heart, the ever-increasing bulk of the right heart, the ever-decreasing cardiac systolic output, and the progressive engorgement of the proximal venous system, venæ cavæ, and liver. It is now easy to see how in acute attacks of beri-beri a sudden failure of the right ventricle with tricuspid incompetence puts the great veins and the liver under systolic ventricular pressure. These are distended to the highest degree and sudden death ends a condition of extreme suffering, the horror of which was so dramatically described by Manson in his handbook of tropical diseases. Throughout this unsuccessful struggle of the right heart the lung fields on the X ray plate are quite clear; there is no lung stasis, no râles, and no pulmonary œdema, and the left heart is not greatly enlarged but, on the contrary, is smaller and poorly filled. A small and rapid, but fairly palpable, pulse gives proof of the relative competence of the left ventricle, until at the last moment before death the latter loses its systolic power, succumbs, and leaves the lungs with stagnating blood and signs of ante-mortem œdema.

This simple mechanism, which explains the whole circulatory complex of beri-beri and the post-mortem findings, has great importance for general cardiology. The so-called safety-valve action of the tricuspid valve, hepatic stasis relieving the lung from threatening high tide, is familiar to a good number of us, but well-defined conditions of functional heart disease, involving both sides of the heart equally, are rather rare. They may be found in the course of acute infectious diseases (pneumonia, diphtheria, and others), but here so many different toxic and reflex influences complicate the picture that the separate influence of each is not easily discriminated. Another condition in which both sides of the heart are hampered in their action to exactly the same extent is rapid paroxysmal tachycardia and auricular flutter and fibrillation. In otherwise normal hearts it has been possible to show that here also there is marked stasis in the large veins and liver coincident with absence of lung stasis, râles, and dyspnœa. Since James Mackenzie discovered the change of circulation caused by the onset of what he called auricular paralysis, now known as fibrillation, in long-standing mitral stenosis, we have been acquainted with sudden, painful swelling of the liver; from personal experience this change is often accompanied by a striking improvement in respiration, and relief of the suffocating dyspnœa.

Once I recognised this mechanism, I was able to find it in a great many cases of slowly progressive, general myocardial weakness. Careful treatment, with well-apportioned doses of digitalis and diuretics, may cause lung œdema and swelling of the liver to disappear, even in extreme conditions, but only for a time. These intervals, during which equilibrium between the right and left heart is maintained with difficulty, become shorter and shorter, until at last treatment fails and the patient dies in a few hours. In many of these cases of recurrent heart failure the first and chief symptom is a rapid and very painful swelling of the liver. Even in rapidly fatal cases the same symptoms may be found, râles and lung œdema only showing themselves during the last hours of life.

In all these conditions the curious relationship between right and left heart failure may be recognised, but nowhere is it so uncomplicated, so regular, and so easily demonstrable as in the beri-beri heart. Thus there is a law of circulatory correlation between the two sides of the heart which may be formulated as follows: *In equal and increasing feebleness of the whole heart muscle the patient suffers most and dies from the failure of the right side of the heart only.*

Shimazono and Aalsmeer do not accept the conventional view that degeneration of the vagus fibres is the cause of the heart failure. Considerable dilatation of the heart may be present long before the first manifestations of polyneuritis. There is no parallelism between the degree of degeneration of nerve-fibres and that of the heart affection; indeed, it is the strong, apparently still healthy patient who seems to be most liable to the serious sudden acute attacks, in contrast with the patient whose first symptoms are those of palsy from polyneuritis. Aalsmeer is probably right in thinking that the relatively good nerve-fibres of the strong man enable him to undertake an amount of exercise which asks too much of his already weakened heart and induces the sudden attack of heart failure.

This vagal factor being unacceptable, we have to seek other clinical facts that would reveal the one potent unknown factor of this disease. The first hint is given by reasoning that, in our explanation of the development of myocardial failure in beri-beri, there seems to be no place for the hypertrophy of the heart muscle so often described. Why should the muscle that from the very beginning is showing all the signs of reduced contractile force and lessened output become hypertrophic? Such conceptions as

"hypertrophie passive par faiblesse du myocarde," or "the individual fibres becoming weaker . . . an attempt is therefore made to compensate by increasing the number of fibres—i.e., hypertrophy," do not elucidate the problem. The only way out of the difficulty seemed to be to look for another explanation of the post-mortem findings of increased weight of the whole heart and increased thickness of the muscle walls.

Aalsmeer found that, even in the worst conditions of failure, the beri-beri heart gives a perfectly normal electrocardiogram, without arrhythmia, extrasystoles, heterotopic rhythms or disturbance of conductivity in the bundle or in the conducting fibres of the ventricle. This fact reminded me that the old observations of MacWilliam record non-contracting heart muscle without disturbance of conductivity. Thirty years ago Engelmann found that the frog's heart muscle when immersed for a short time in water loses its contractility but retains its excitability and its power of stimulus conduction, showing that this phenomenon, discovered by Biedermann in voluntary muscle, holds good also for heart muscle. Later de Boer demonstrated that the swelling of the heart muscle, caused by the water, reduces mechanically the contractile power of the muscle-fibre, but at the same time the electrocardiogram may continue completely unchanged. Skramlik, Lusanna, Zondek, and Kraus demonstrated the same phenomenon for other forms of water retention in muscle-fibres, and even found that the size of the waves of the electrocardiogram may be enlarged and the rate of conduction increased. The presence in beri-beri also of this strange contrast between evident weakening of the heart muscle and the undisturbed or accelerated automatic excitatory processes suggests that here also *the nature of the affection might be water retention* ("Quellung") *with consequent swelling of the heart muscle-fibres*, and that this swelling, rather than a true hypertrophy, may be the cause of the increased weight and thickness of the heart muscle wall as found post mortem.

The Water Retention Hypothesis.

Many arguments support this hypothesis. A few months ago Tiemann showed that striated, in contrast with smooth muscle-fibres, swell in water and in all hypertonic solutions. The gain in weight and the swelling, due to the quantity of water taken up, is less in heart muscle than in common voluntary muscle. If the same process is at work in beri-beri we should expect to find the skeletal muscles swollen at the same time as the heart. This swelling is, in fact, typical of the disease, especially at the beginning, long before general tissue œdema or signs of nerve degeneration appear. Swelling is most conspicuous in the muscles of the calf, which are very painful in walking and on being pinched. Pekelharing, Winkler, and Nocht compared the condition with the "pseudo-hypertrophic stage" in progressive muscular atrophy of childhood.

On this hypothesis we should expect that no treatment can succeed which does not free the heart muscle from its surplus water and drain the muscle-fibre. When vitamin B is given, the heart rapidly diminishes in size and recovers its power of contraction, and the skeletal muscles share in this process. The hard, thickened, and painful muscles of the calf melt away, as snow in the sun, to muscles of normal size and function. De Langen, in his new monograph on beri-beri, mentions this rapid disappearance of the swelling and equally rapid cure of the motor paralysis, less than 24 hours after taking vitamin B-containing food. This remarkable improvement is accompanied by a marked increase in the secretion of urine. Scheube states that katjang idjoe had the reputation in Japan a thousand years ago of being a good diuretic. Of recent years the diuretic action of rice-bran and katjang idjoe has been specially investigated by Japanese scientists.[1] From the extensive work on the regulation of water exchange by Magnus and by the Vienna Pharmacological Institute (E. P. Pick, Molitor Baer) we learn that striated muscle may take up and, under certain circumstances, can retain large quantities of water injected into the blood or taken by the mouth. Our muscular system may be regarded as one of the biggest water reservoirs, and its contents do not appear on the balance of intake and output.

Recent research work by Tsunoda and Kura[2] gives important information concerning the anatomy and treatment of beri-beri. In pigeons exclusively fed on polished rice the sensory nerves and their endings in the skin show curious primary regressive metamorphosis accompanied by swelling and other changes in their microscopical appearance. After the injection of small doses of vitamin B all these changes and their clinical consequences disappear rapidly. The endings of the sensory and motor nerves improve rapidly within five hours after the injection. Twenty-four hours later the histological appearance is practically normal.

The conception of water-retention in the heart muscle-fibre explains all the symptoms and peculiarities of the beri-beri heart, which thus constitutes a hitherto unrecognised and unique form of heart muscle disease. Before trying to bring this curious pathogenesis into relation with other well-known facts of physiology and general pathology, I must mention an equally unique phenomenon in the symptomatology. Not only is the electrocardiogram normal during the whole course of the disease, but the rate of conduction is increased and the atrio-ventricular interval is shortened. Moreover, conduction quickens as the heart failure progresses. In the most serious and acute cases the shortest atrio-ventricular intervals were found when the patient seemed to be in imminent danger of death. With recovery the conduction slowed down to normal, even with slowing of the rate of the heart beat. The fact that the same phenomenon was found experimentally in water-swelling of the heart muscle is a strong argument in favour of the identity of this condition with beri-beri heart.

Theoretical Considerations.

It seems very probable that water-retention may be the primary cause of other manifestations of beri-beri and, in the first place, of the important degenerative processes in the whole peripheral nervous system. We have already seen that the swelling of nerve-endings in chicken beri-beri disappears completely a few hours after vitamin treatment. The microscopical anatomy of nerve-fibres and ganglion cells in beri-beri accords well with this conception, and it should not be forgotten that although motor and sensory paralysis may be found, as in polyneuritis, the primary affection of the nerve element in beri-beri is not inflammation. It is the general opinion that the anasarca is not so much secondary to heart failure, as essentially an imbibition process of the tissues. Other organs may show temporary swelling at the same time. Some of the glands seem to possess a special predisposition for this kind of water-retention in beri-beri, just as striated muscle is the first tissue to swell while smooth muscle escapes. A familiar pathological finding in this disease is swelling of the mucous lining of the gall-bladder. Kieviet de Jonge mentions a curious broadness of the face, recalling parotitis, and he found that there is enlargement of both parotid glands, the nature of which, he says, is "not œdema." Stepp thinks it probable that some of the glands, especially those secreting saliva, ceased to function.

It would be astonishing if beri-beri were the only disease in which water-retention directly damaged the heart. When an ailing heart does not react to heart drugs we generally suspect a desperate anatomical and functional condition of the myocardium; it seems possible that the cause found in beri-beri plays a part in the development of such events and might be removed by analogous forms of treatment. The first disease to remember in this connexion

[1] Japan Jour. of the Med. Sciences, 1927, viii.

[2] Virchow's Archiv, 1928, p. 267.

is myxœdema, where there is water-retention as a consequence of insufficient thyroid secretion ("Quellung"), and where water is expelled ("Entquellung") by thyroid treatment. A case of atypical myxœdema may be shortly related here:—

Some 20 years ago a small Frisian community sent a poor man to the medical clinic in Groningen because he was more or less stupid and so easily tired that he was incapable of any bodily work. His face showed a certain degree of imbecility or apathy, and his muscular function was greatly diminished; but his build was Herculean. There was no trace of œdema, the face was not swollen, and the heart seemed normal. The muscles were not only big, but very hard and of abnormal consistence; I thought this might be myxœdema of uncommon localisation. A few thyroid tablets had a most astonishing effect; the firm voluminous muscles that were very painful on pinching became thinner, softer, and fit for use again. On palpation the peculiar sensation of rolling muscle bundles returned, leaving only a few hard nodes, which disappeared in a day or two. In a week's time the normal intellect of the man had returned and he was sent back to his village and advised to take small doses of thyroid indefinitely. To the great satisfaction of his community he proved completely cured and able to do regular work, but with less Herculean muscles.

The absence of heart and nerve lesions, on the one hand, and the inactivity of thyroid in beri-beri on the other, prove that this case was not beri-beri, and the two conditions of different nature.

Another important difference was noted by Aalsmeer. In both diseases there is a greatly increased skin-resistance in the patient to the electrocardiogram; more in beri-beri than in myxœdema. But the deflections of the string are very small in myxœdema and at the least normal, or sometimes much larger than normal, in beri-beri.

These clinical facts point to the quite peculiar and specific nature of the swelling of the striated and heart muscle, which is certainly not a condition of œdema.

Heart Hormones and Automatins.

Our subject forms a bridge between scientific research at the bedside and modern experimental work on heart "hormones" (Haberlandt) and "automatins" (Zwaardemaker). Rigler[3] found that vitamin B, isolated as a pure chemical substance by Jansen and Donath, belongs to this group of substances. He believed it to be identical with histamin. The fact that the organism itself produces substances which are able to bring an experimentally stopped heart and its automatic functions back to life has already induced experimental workers to recommend these substances for the treatment of heart patients. The beri-beri heart shows that at least in some rare conditions the revival of a seemingly lost heart is possible. There are doubtless a great number of different conditions causing standstill of the heart, and doubtless we shall hear, in the course of time, of a great number of different substances which may help. The beri-beri heart shows that not every heart that stops its systolic action has lost its regular automatic vital function. The automatism may go on undisturbed, but is prevented from manifesting itself by lack of conductivity or, as in beri-beri, by interference with contractility. In such cases the active substance which restores the regular function should not be called an automatin; what happens in the heart is not revival from death, but release from bondage.

Summary.

My subject shows eloquently that careful study of the sick and their symptoms, and free experimental research are equally indispensable to the advancement of medicine.

It teaches us the existence of a law of circulatory correlation between the left and the right heart, working along simple mechanical lines of considerable clinical importance.

It leads us towards the better understanding of a disease, of which the successful treatment had already been found by experience at the bedside.

It brings us into close contact with the most modern biological problems of water exchange, of hormones, of sudden death, and revival of vital functions.

It seems permissible to formulate the hypothesis that the fundamental process in beri-beri is water retention and the consequent swelling of certain vital tissues, especially nerve and striated muscle.

[3] Med. Klinik, 1928.

THE LATER RESULTS OF PARTIAL GASTRECTOMY.*

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Few subjects have received more attention or have been the cause of intenser controversy during recent years than that of the nature and treatment of gastric and duodenal ulceration. From the surgical point of view the discussions have, for the most part, ranged around the relative merits of partial gastrectomy and gastro-enterostomy. It is not proposed in this article to consider partial gastrectomy as a treatment for new growths—for here the obligations of the surgeon are sufficiently clear—but to limit the review to cases of apparently non-malignant ulceration.

It will be well at the outset to summarise the standpoints taken by the several schools of thought at the present day. (1) The first school believe that operative treatment should never be adopted in the absence of acute complications such as perforation; they maintain that the symptoms can be adequately controlled by purely medical measures. For obvious reasons this group consists almost exclusively of physicians. (2) The second group comprises those who think that operation may be occasionally justified in very persistent cases, and especially in the presence of such complications as pyloric stenosis. Into this group fall many physicians and a few surgeons who have been unfavourably impressed by the recurrence of symptoms or the onset of jejunal ulceration after gastro-enterostomy. (3) The majority of English surgeons belong to the third group and favour gastro-enterostomy for chronic cases, after medical treatment has been given a trial, but would treat all acute cases medically. (4) Others advocate gastro-enterostomy, with or without pyloric exclusion, for practically all cases. (5) Yet another school consider that for the majority of cases of gastric ulceration partial gastrectomy is indicated, but perform gastro-enterostomy for duodenal disease. (6) The last school believe partial gastrectomy to be the operation of choice in all cases, and would always perform it for both gastric and duodenal ulceration if the technical difficulties are not insuperable.

With such diversity of opinion the only safe guide is a critical and, as far as possible, unbiased examination of the results. Since this article will deal only with the surgical aspect it is essential, as a prologue, to give reasons why the claims of the first school, that surgical treatment is unnecessary, cannot be entertained. Unfortunately, perhaps, for the surgeon's proper judgment, the great majority of the cases upon which he operates have already received a prolonged course of medical treatment, a circumstance likely to prejudice his opinion of these claims. The discovery of signs of old healed ulcers is offset by the presence of the fresh outbreak for which the operation is undertaken. The treatment therefore, even in such cases, has done little more than allow the original ulcer to heal without removing the cause. Post-mortem evidence of completely healed ulcers is, in my experience, much rarer than that found at operation for a fresh outbreak; it thus appears reasonable to conclude that medical treatment can rarely bring about permanent cure. Moreover, relief of symptoms is not necessarily accompanied by cure of the ulcer.

* Being a paper delivered before the South-West London Post-Graduate Association.

The list of possible surgical procedures is a long one, and each operation has its advocates and indications. 1. Posterior gastro-enterostomy. 2. Anterior gastro-enterostomy. 3. Gastro-enterostomy with pyloric exclusion or entero-anastomosis. 4. Finney's operation. 5. Local excision by knife or cautery. 6. Local excision and gastro-enterostomy. 7. Sleeve resection. 8. Partial gastrectomy (Billroth 1 and 2; Polya and its modifications). 9. Jejunostomy. 10. Denervation. Of these only gastro-enterostomy and partial gastrectomy will be compared, the indications for the others falling outside the scope of this article.

Data.

The cases reviewed occurred in the author's practice during the five years 1922–27, and none of less than one year's post-operative history are included. The total number of gastric operations was 221, and of these 65 were partial gastrectomies and 71 gastro-enterostomies; the percentage of gastrectomies, however, rose from 5 per cent. in the first year to 62 per cent. in the final year under review. In the first instance inquiry was made by a circular letter including a series of simple questions designed to overcome any reluctance on the part of the patient to record unsatisfactory results; for previous experience had shown that patients hesitate to state slight inconveniences.

As many patients as possible were then personally interviewed and re-examined; plenty of volunteers were found for additional investigation by bismuth meal, test meal, blood counts, bacteriological tests, &c. In this way the subsequent history of a considerable number has been obtained in detail, with records of the ultimate results of the special tests. In classifying the results, those who, in addition to giving entirely satisfactory answers to the questions, added enthusiastic comments about their health, were called "satisfactory + +." Those who answered all questions in a gratifying manner without comment were classed as "satisfactory +." Where the patient had received complete relief of symptoms but complained slightly of occasional fullness and constipation the result was called "satisfactory." Patients who stated they were better but still had attacks were "unsatisfactory," while patients with recrudescence of symptoms or development of fresh ones were "unsatisfactory +." One of the questions related to the type of food taken, and unless the reply was that all foods were taken without restriction the patient was not placed in the "satisfactory" group. Of the 65 gastrectomies 8 were subsequently proved by section to be carcinomatous ulcers, and have therefore been placed in a separate table.

Partial Gastrectomies for Simple Ulcer (51). Result in Percentages.

Sat. + +	76	Unsat.	2·5
Sat. +	19 (95)	Unsat. +	0
Sat.	2·5		

Partial Gastrectomies for Ulcers Proved Carcinomatous (8).

One died as result of operation and 2 subsequently of recurrence. Of the remainder 3 are satisfactory + + and 2 satisfactory +.

Gastro-enterostomies for Simple Ulcers (61). Result in Percentages.

Sat. + +	45	Unsat.	21
Sat. +	6 (51)	Unsat. +	15
Sat.	12		

Thus 95 per cent. of the partial gastrectomies have no symptoms of any sort and are able to take all kinds of food without restriction, and 51 per cent. of the gastro-enterostomies come into the same category. Only 2·5 per cent. of the gastrectomies are unsatisfactory, but 36 per cent. of the gastro-enterostomies fall under this heading. There can be no doubt, therefore, that from the point of view of complete and permanent relief of symptoms gastrectomy is a much more satisfactory operation than gastro-enterostomy, although 63 per cent. of patients treated by the latter method are cured or improved.

The mortality figures rather counterbalance this satisfactory conclusion, for 6 of the gastrectomy cases died within four weeks of the operation, 2 of hæmorrhage, 2 of pneumonia, and 2 as the result of gastric fistula following the Billroth 1 type of anastomosis. Both these last two were debilitated patients with enormous ulcers (one malignant) very adherent to surrounding structures, and no other procedure seemed possible. The Billroth 1 operation is notoriously liable to leakage if there is the slightest tension on the anastomosis, which is difficult to avoid after an extensive resection. It is legitimate, therefore, to exclude these from the ordinary mortality. They come early in the series, and with additional experience it is certain that they would now either be left alone or treated by jejunostomy. The other four cases constitute a mortality of 6·3 per cent., a figure capable of reduction, probably to half, with care. On the other hand, there was no mortality in the gastro-enterostomy series. Further analysis of the mortality figures gives the following:—

	Per cent.		Per cent.
Gastro-enterostomy	0	Billroth 2	7·5
Sleeve resection	20	Billroth 1	100
Polya	0		

The 20 per cent. for sleeve resection is obviously misleading, as there were only five cases in the series and the death of one from hæmorrhage was due to the use of catgut subsequently found to be defective. According to these results the Polya would appear to be the safest type of gastrectomy, but the total number of each type performed must be taken into consideration.

Gastro-enterostomy without perforation	61	Polya	18
		Billroth 2	40
Sleeve	5	Billroth 1	2

Even then the Billroth 2 operation is found to have the greater risk, but there was no mortality when it was performed in two stages. The further statistics of the gastrectomy cases are as follows:—

Male 46	Average age, 39	Incidence of carcinoma cases	13 per cent.
Females, 17	" 44		12 "

The types and position of ulcers were: gastric (body) 12, gastric (pyloric) 5, duodenal 6, doubtful (pyloric) and not mentioned 21, multiple 6, jejunal 7, carcinomatous 8. This list only records the position of the chief ulcer and does not take any account of healed scars or other small ulcers. Had these been included the percentage of multiple ulcers would have been about 90.

After-results of Gastrectomy.

All the gastrectomy cases have gained weight since the operation, some of them as much as 3 st., and they all look remarkably healthy. In one or two cases there appears to have been an excessive deposition of fat, and two mentioned the development of an abnormal desire for highly spiced foods.

Practically all the cases had fractional test-meals carried out shortly after operation, and with one exception showed complete achlorhydria. Those taken after an interval of several years demonstrate quite conclusively that the achlorhydria is permanent. None of them showed the slightest trace of free hydrochloric acid. The average total acid was less than 10, and the average total chlorides in the absence of bile 29; when bile was present this rose to over 70. Typical examples are given in Figs. 1 and 4. Bismuth meals, also conducted after a long interval, show that the remnant of stomach undergoes considerable increase in size; emptying is rapid, never taking longer than an hour and usually much less. The stoma in the Polya and Billroth 2 operations lies more or less horizontally, and is fairly well defined in the radiograms. There is no radiographic evidence of any effect upon the movements of the small or large intestines.

Blood examination revealed a high count corresponding to the patient's appearance of health; no

case showed less than 4,800,000 red cells. The average of all the counts gives—

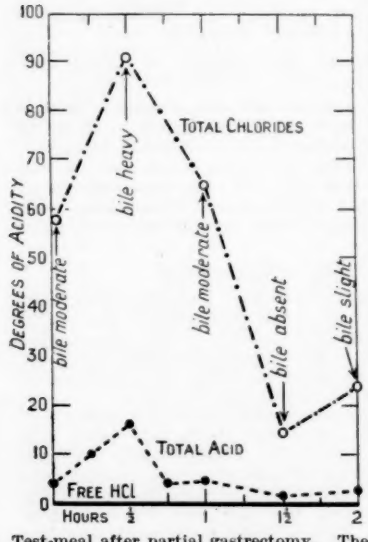
Red blood cells	5,250,000	Eosinophils	1·5 p.c.
Hæmoglobin	91·2 p.c.	Basophils	0·5 ,,
Colour-index	0·84	Large hyalines	5·4 ,,
White blood cells	7,160	Lymphocytes	30·4 ,,
Polymorphs	61·8 p.c.		

Bacteriological examination of the teeth, gums, tonsils, and throat in a series of cases yielded streptococci in several, but in no case were they hæmolytic.

The reasonable deductions from these statistics are that gastrectomy gives much more satisfactory ultimate results than gastro-enterostomy; that it has a mortality of about 7 per cent., whereas there is no mortality from gastro-enterostomy; that jejunal ulceration does not occur after gastrectomy, whereas a proportion of the gastro-enterostomies have symptoms suggestive of such ulceration, and subsequent gastrectomy has sometimes been necessary for definite jejunal ulceration. The exact incidence of jejunal ulceration in the gastro-enterostomies is uncertain because some cases with suggestive symptoms have not been explored, but if we include these the percentage is over 10. The gastrectomies include a large percentage of the more difficult and serious cases with extensive ulcers penetrating surrounding structures, while the gastro-enterostomies include most of the cases of simple duodenal ulceration where the operation was easy.

The total number of jejunal ulcers is too small to allow any definite conclusions, but the accepted idea, that they occur more frequently after duodenal ulceration, is supported, while excision of the original ulcer at the time of operation appears to make no difference to their incidence. Some competent observers deny that jejunal ulceration is rare after gastrectomy, and also state that its incidence is as high after gastro-enterostomy in those cases that show no post-operative acid as in those where acid remains high. There are objections to both these arguments against the importance of hydrochloric acid in the ætiology of jejunal ulceration. It has been definitely established that some patients were not achlorhydric after gastrectomy owing to the very limited resection performed, often little more than a pylorectomy. In the author's experience those cases of gastro-enterostomy which show little or no acid after operation will be found to have had very little acid to start with; this usually means that the ulceration is almost always multiple and of long duration, with the development of a secondary atrophic gastritis (Fig. 2). Under these circumstances the anastomosis may actually be made at the site of mucous ulceration, a condition which would naturally predispose to the development of jejunal ulcer. It will also be obvious that unless the total chlorides are estimated it is impossible to state whether the achlorhydria is due to neutralisation or lack of secretion. In the former case there is no guarantee that the test-meal is an accurate indication of the acid content (or its absence) after ordinary diet.

FIG. 1.



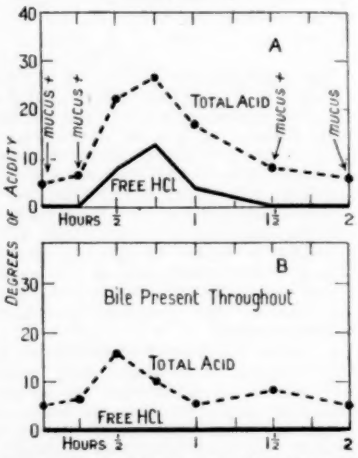
Test-meal after partial gastrectomy. The effect of the presence of bile upon the total chlorides is well seen.

If it be agreed that the results of partial gastrectomy are much better than those of gastro-enterostomy, the following questions arise: 1. Is the mortality of partial gastrectomy justifiable? 2. Are the results permanent? 3. Are there any remote effects of the removal of large portions of the stomach? 4. In what way does gastrectomy act?

The Alleged Deleterious Results of Gastrectomy.

In the series under review the oldest cases have more than six years' post-operative history, while quite a large proportion have more than three years. It may be doubted whether even these periods constitute a true test of permanency, especially since many cases of jejunal ulceration after gastro-enterostomy do not become urgent for many years (certainly more than ten). Nevertheless most patients complain of premonitory symptoms within a limited time (usually a few months) of the operation, whereas the gastrectomy cases all express themselves as entirely free of any warning symptoms. Their general state of health, too, is patently incompatible with continued ulceration. It may be accepted, therefore, as the result of actual experience, that the good results obtained are permanent in the practical application of that term.

FIG. 2.



Curves obtained before operation (A), and after operation (B), in a case of prolonged multiple gastric ulceration with atrophic gastritis, showing the small acid content before operation (gastro-enterostomy with cauterisation of the ulcer). The achlorhydria is chiefly due to neutralisation, which would probably not be so complete after an ordinary meal.

It has often been suggested that untoward remote effects may follow partial gastrectomy, especially as all the cases have complete achlorhydria. The relationship of achlorhydria to pernicious and other anæmias has been thought by some to be one of cause and effect; for this reason the blood examinations made some considerable time after the gastrectomy are particularly interesting. No case shows any sign of primary anæmia, but the hæmoglobin and colour-index are rather below normal; the total leucocyte count is normal, the polymorphonuclears being perhaps slightly low. It can therefore be stated with confidence that this series affords no evidence of any deleterious effect of achlorhydria upon the blood count. (Cases of malignant ulceration must obviously be excluded; some of the discrepant results obtained in the past may possibly be explained by failure to separate malignant and simple cases.) No patient is known to have died since the operation, so that any subtle intangible lowering of the resistance to other diseases, especially infections, can be excluded. The stools were not examined bacteriologically, but there were no clinical signs of any abnormal infectivity of the intestinal contents, nor was there any radiographic evidence of nervous or chemical interference with the action of the small or large intestine.

The tendency to excessive deposition of fat in two cases could conceivably be due to some alteration in the metabolism of food, but is probably more correctly

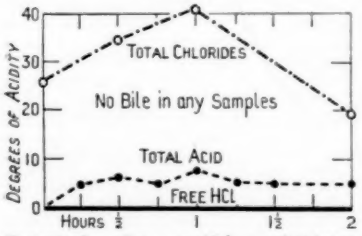
explained as an inability of the tissues, often long starved, to deal efficiently with the sudden excess of food products with which the patient, now relieved of his pains, supplies them. In other cases it may be merely the resumption of the patient's normal build and habit. The slight qualitative change in appetite reported by two patients may be due to the removal of a large sensory area from the stomach mucosa, but was too vague and trivial to warrant much attention.

On the whole, then, it seems that there is not an iota of evidence that any remote deleterious effects follow gastrectomy. Indeed, the patients appear to be in a much better general state of health than they had been for many years.

The Mortality of Gastrectomy.

The definite, if small, mortality associated with gastrectomy cannot be dismissed so easily. In this series the gastrectomies include all the most difficult cases, while the mortality associated with any subsequent operation for jejunal ulceration (notoriously difficult to treat and usually demanding partial gastrectomy under the worst circumstances) should be remembered in estimating that of gastro-enterostomy. With these modifications the difference in the mortalities is much reduced, some say equalised. All discussions of mortality are, however, futile until the type of case for which the operation is to be limited is defined. Those who recommend gastrectomy for all cases of duodenal and gastric ulceration agree that the mortality is little greater than that of gastro-enterostomy with its later complications; those who limit the operation to large gastric ulcers state correctly that such conditions are very serious at the start and that, provided the mortality is small, the operation is amply justified. The mortality is capable of further reduction; probably the surgeon's experience is the most important factor, but greater pre- and post-operative care are possible. Transfusion, special dieting, attention to oral sepsis, and especially the postponement of operation upon any signs of infection of throat or lungs should never be neglected. In all serious cases the operation should be a Billroth 2, performed in two stages with a suitable interval.

FIG. 3.

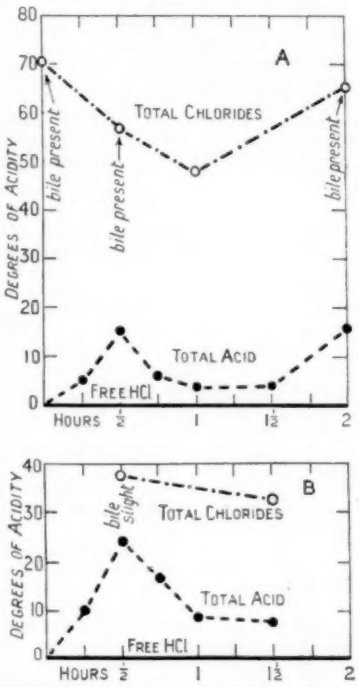


Test-meal after partial gastrectomy, showing achlorhydria and low total chlorides in the absence of bile, indicating that achlorhydria is not merely a question of neutralisation.

After the operation every precaution must be taken to prevent chest complications. The value of extensive splanchnic and field block anæsthesia is doubtful; it was used in a large percentage of these cases without any effect upon the incidence of chest complications, though it probably rendered the convalescence smoother. In most cases the general anæsthetic was intratracheal ether or chloroform, and there was no noticeable difference in the effects upon the lungs. There is no doubt that post-operative "pneumonia" in these cases is due much more to the lowering of vitality and interference with upper abdominal movement than to the type of anæsthetic, so that speed, facility of access, and clean, gentle manipulation are of great importance. The other causes of mortality are definitely avoidable by attention to technique, and there is no reason why it should rise above 2 or 3 per cent. If such a figure be approached there can be no doubt that the operation is not only justifiable but actually advisable instead of gastro-enterostomy.

Among other arguments in favour of gastrectomy is the avoidance of the risk of subsequent malignant change in the ulcer. Some cases not included in this series definitely prove that such a change can occur, even after gastro-enterostomy, but it is certainly uncommon, and the high percentages given by some observers are undoubtedly founded upon a misinterpretation of the premises necessary to establish a diagnosis of malignancy. If malignant change were common, any series of gastro-enterostomies should show a fairly large subsequent mortality from this cause; even if it be assumed that gastro-enterostomy largely prevents malignant changes, a percentage of the cases will be unknowingly malignant when operated upon. The cases of carcinoma included in this series were for the most part only definitely diagnosed microscopically after removal. The conclusions are: (1) that malignant change can occur in ulcer, although it is probable that the majority of carcinomata start de novo; (2) that a certain number of cases, apparently of ulcer, will be found definitely malignant upon microscopy. These are obviously arguments in favour of gastrectomy, but neither event is common, and I would not stress them.

FIG. 4.



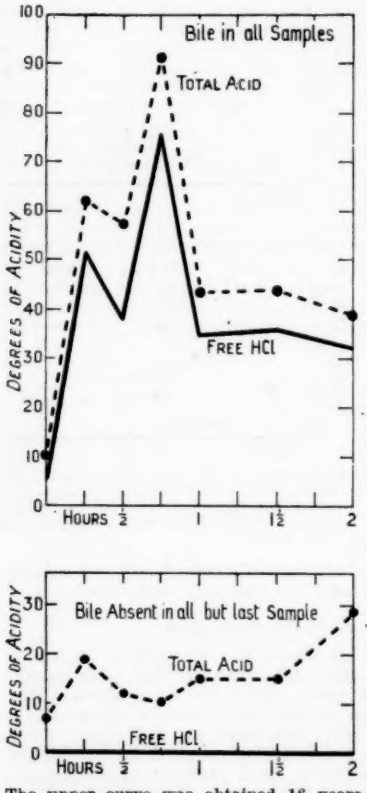
The lower curve (B) was taken a fortnight after partial gastrectomy, whilst the upper curve (A) was obtained two years later. It shows the permanency of the type of curve.

How Gastrectomy Acts.

The limitation of ulcers to the pyloric region is marked, but not absolute, while the fact that jejunal ulceration occurs after short-circuiting shows that gastrectomy is not simply the removal of an ulcer-bearing area. Hyperchlorhydria has long been accepted as an important ætiological factor in the production of ulceration, and there is at least some association between the two. Accordingly it is assumed that gastro-enterostomy produces its effects by neutralising the acid with the alkaline contents of the jejunum. The post-operative test-meal curves show positively that there is an essential difference between the effects of partial gastrectomy and gastro-enterostomy. The gastro-enterostomies show merely a reduction in acidity (Fig. 5), while the gastrectomies reveal complete absence of free hydrochloric acid. This is not simply due to more effective neutralisation, for the total chloride is always very low in the absence of obvious bile or mucus (Fig. 3). This raises a point of some importance in the physiology of the stomach, for it can only be explained by assuming: (1) that the pyloric half of the stomach is the only portion capable of secreting acid—this is at variance with ordinary physiological teaching; (2) that the operation so profoundly modifies the general activities of the stomach, either by nervous reflex or locally, that the remaining cardiac half permanently ceases to secrete acid. Recent work upon the control of

secretion, the secretion of neutral chlorides, and the effect of duodenal regurgitation has amply shown that the whole question is much more complicated than was formerly believed; I hesitate, therefore, to draw dogmatic conclusions upon what may easily prove to be inadequate data. Whatever the laboratory findings, however, these clinical facts demand recognition and critical examination. The fact that where the whole of the pyloric half was removed, no matter how much of the cardiac portion remained, complete achlorhydria resulted, while cases of limited pylorectomy (not included in this series) revealed in every instance merely reduction of acid, seems to prove that the results cannot be dismissed as erroneous or fortuitous. That the removal of varying amounts of the pyloric end would so consistently and permanently affect the secretion from the cardiac end scarcely appears feasible, but the rate of emptying of such a stomach is very rapid, and MacLean has recently shown that "the gradual decrease in acid concentration in the stomach during the completion of ordinary digestion in normal dogs is a function of the stomach itself, and in no way dependent upon regurgitation of alkaline duodenal contents." It may be that the absence of secretion is also an intrinsic "function" of the stomach when its general physiology is disturbed by the performance of a gastrectomy. A nervous reflex effect is excluded by the fact that sleeve resection, in which the division of nerves is almost as extensive as in the usual partial gastrectomy, is not followed by achlorhydria. The same applies in greater degree to definite denervation operations of which a typical post-operative curve is given (Fig. 6). The simpler suggestion—i.e., that the acid-secreting portion is removed—is probably the correct one. The physiological teaching with which this disagrees is chiefly founded upon experimental work on dogs, the results of which should only be applied with great reservation to human beings. The histological evidence of the presence of acidophile cells in the cardiac glands is also inconclusive, for it may be argued that the cytoplasm of a cell secreting acid would be left on the alkaline side of neutrality. The intimate physiology of these cells is not sufficiently understood for us to deduce the exact chemical changes which occur in the cytoplasm. A test-meal after partial gastrectomy is not without difficulties and uncertainties, and the results may be due to the collection of material from the jejunum rather than the remaining stomach. The characteristic curves given here, especially the effect of bile upon the total chlorides, and the general uniformity of results over a series of cases, suggest, however, that they are not the result of technical errors.

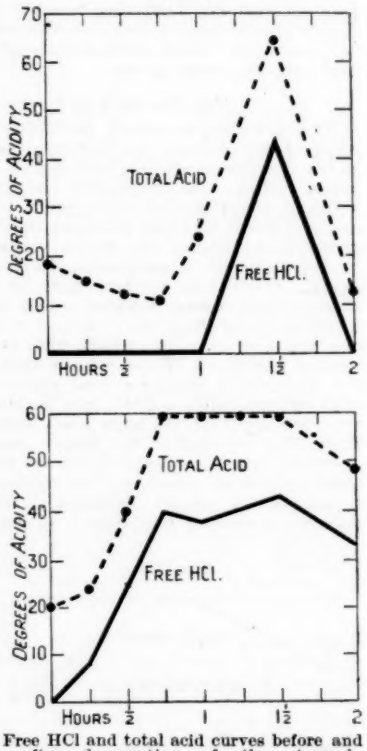
FIG. 5.



The upper curve was obtained 16 years after performance of posterior gastro-enterostomy, and shows that despite admixture of bile the free acid still remains high. At operation the pyloric ulcer was found to penetrate surrounding structures: the whole pyloric end of the stomach, including the anastomosis, was excised, and a fresh Polya type of anastomosis was performed to the cardiac end. The lower curve shows the resultant achlorhydria, occurring despite absence of bile. These curves demonstrate the profound difference between the effects of gastro-enterostomy and gastrectomy.

Those who believe that hydrochloric acid bears an ætiological relationship to ulceration find in this result a ready explanation of the success of partial gastrectomy. The growing school, however, who regard acid and ulcer as concurrent effects of an unknown cause will still be at a loss. On the whole, the evidence derived from these cases of gastrectomy is rather in favour of reinstating acid as an important ætiological factor which may, of course, be, and indeed probably is, itself secondary; for not only is the abolition of acid the most conspicuous result of the operation, but the rarity of subsequent jejunal ulceration is also best accounted for in this way. (Some believe that this result is due to the removal with the original ulcer of the possibility of infection of the suture line. As we have already seen, however, excision of the ulcer with gastro-enterostomy is not followed by immunity.)

FIG. 6.



Free HCl and total acid curves before and after denervation of the stomach, showing no reduction in free acid but alteration in general character.

The activity of pepsin is commonly ignored in considering the ætiology of ulceration, largely on account of the difficulties of quantitative estimation of enzymes, but it would probably be more accurate to use the term "pepsin hydrochloric acid" in place of plain "hydrochloric acid" throughout. The idea that the pyloric end of the stomach is responsible in man for the production of acid deserves the attention of physiologists. It certainly fits in satisfactorily with the division of the stomach into two functionally separate portions, a view supported to some extent by morphology and by radiology, the cardiac end being considered merely as a storehouse for food taken intermittently at meals, from which the actively digestive pyloric end is slowly and continuously supplied with pabulum.

Predisposing Conditions for Ulceration.

There has, in the past, undoubtedly been too great a tendency to think of gastric and duodenal ulceration

as a local isolated lesion, a tendency which is reflected in the embolic theory and others where the microscopic anatomy of arterial distribution is held responsible. Careful examination of the ulcerated stomach or duodenum shows the great frequency of multiple ulceration, of the recurrence of ulceration at fresh sites, and of healed ulcers. These findings are especially important when founded upon the investigation of the parts removed by gastrectomy, or even better when seen in the live subject through a gastroscope (an instrument which the author has frequently used in these cases), for there can then be no suspicion of post-mortem effects. It is not going too far to state that almost all cases with prolonged histories afford evidence of multiple ulcers, either active or healed. We are not dealing with a lesion of local origin but with some condition of the stomach which predisposes to ulceration, and of which the ulcer itself is but a manifestation. The occurrence of jejunal ulceration after gastro-enterostomy for ulcer, and its absence after the same operation for carcinoma, favour the view that the contents of the stomach are responsible. The limitation of duodenal ulceration to the first portion, where it is exposed to the stomach efflux, may be also evidence (admittedly equivocal) of the importance of the contents. Yet the distinction between wall and content is not perhaps so great as it may seem, for the content is made up of two parts—the ingested food and the added secretion from the wall. The evidence given in this article, although incomplete, is in favour of a change in the contents as the exciting cause of ulceration, and this can conceivably be brought about (1) by changes in the nature of the secretion, and (2) by changes in the food taken. Once again we meet the relationship between pepsin hydrochloric acid and ulcer, for increase of acid secretion is the most constant and conspicuous change in the contents. Why a stomach should secrete these materials in excess is difficult to see; some authorities, on the evidence of test-meals, deny that they are in excess, but the ordinary test-meal only estimates the strength and not the quantities of acid secreted. When all the clinical and experimental work is examined it must be admitted that the association between the two is so close as to resemble cause and effect. Change in secretion, both quantitative and qualitative, is experimentally produced by alterations in the nature of the ingested food. The classical work of Pavlov showed that there is a psychical as well as a direct secretion, the former being stopped by nerve section. The importance of the psychical secretion in man is difficult to estimate, but it may be the secret of the alteration in gastric secretion. It is certainly intriguing, and perhaps not wholly fantastic, to assume that the flagging appetite of civilisation, with its sedentary occupations and economy of manual labour, is abnormally stimulated by the consumption of highly flavoured and spiced foods with the plentiful addition of condiments. These substances, including the extractives, are known experimentally to produce a copious psychical secretion of gastric juice. Pepsin hydrochloric acid may therefore be produced in large excess of that likely to be absorbed by the meagre quantity of food taken. The acid curves after the usual test-meal of gruel are not those which might be expected to follow the ingestion of a full meal, nor would it be at all easy to estimate the free acid in such a complicated mixture. Duodenal ulcer is said to be commoner among sedentary workers, and the symptoms are particularly prone to recrudescence during periods of mental strain and anxiety when the appetite fails; the same may be said of the symptoms attributed to hyperchlorhydria without ulcer formation. This theory assumes that the stomach is constantly being deceived into producing more secretion than is needed, and in the course of time develops the habit of excessive response. The success claimed for denervation operations may be partly due to the abolition of psychical secretion, although simultaneous cutting-off of the motor control and sensory supply renders definite conclusions impossible. The post-denervation test-meal curve given here shows little change, but of course it makes no pretence of representing the psychical secretion. If the habit of hypersecretion ultimately becomes an intrinsic function of the stomach denervation would produce little effect in established cases. So little is known, however, of the nervous control of the stomach in man and of the effects of denervation that it would be unwise to dogmatise.

Summary.

Ulceration should be regarded as a local incident in a much more fundamental general change in the functions of the stomach. This change, however produced, leads to the secretion of an excess of pepsin hydrochloric acid which may be regarded as the direct exciting cause of the ulceration. The acid may, in an uncertain and irregular fashion, be somewhat reduced by gastro-enterostomy; it can only be abolished by removal of the pyloric half of the stomach. Partial gastrectomy is the only operation which removes the cause of the ulceration in the majority of cases and which can be trusted to result in permanent cure. (Some may object to the use of this word when the affected part is excised.) This conclusion is amply borne out by the details given in this paper. The author has not quite enough courage in his convictions to subject to partial gastrectomy all cases of gastric and duodenal ulceration at whatever stage, but treats early cases upon medical lines in the hope that some change may thus be effected in the secretory activities of the stomach. In cases of simple duodenal ulceration of short history a partial gastrectomy appears unnecessarily severe when a safe gastro-enterostomy so frequently relieves the symptoms. This is perhaps not illogical, for in such cases the acid content is not always high and may therefore be sufficiently reduced by partial neutralisation. If the pre-operative test-meal reveals a high acid content it is probably wise, even in these cases, to perform a partial gastrectomy and so escape further ulceration, perhaps in the jejunum. For all other cases partial gastrectomy is the operation of choice, and, if the presence of adhesions, penetration of ulcer, or difficulty of access will obviously render the operation a difficult and dangerous one, the possibility of anastomosis of jejunum with the cardiac half of the stomach and the resection of the pyloric end at a subsequent operation, as in the Billroth 2 method, should be seriously considered. In this way an operation, otherwise serious, may be rendered comparatively safe. Where gastro-enterostomy has already been performed without relief of symptoms, partial gastrectomy holds out a very good hope of cure; indeed some of the most gratifying cases in the series come into this group. In the absence of jejunal ulceration it is sometimes possible to utilise the gastro-enterostomy aperture, the pyloric end being excised as in the Billroth 2 operation. Where the original anastomosis has been performed towards the pyloric end, or where jejunal ulceration is present, the whole is excised with the stomach and a fresh anastomosis made, usually by the Polya method. The former is a very safe procedure, but the latter may in some difficult cases demand the utmost dexterity and care.

Ulcers in the cardiac half of the stomach are not so uncommon as is sometimes thought. Where the ulcer is capable of local excision, without danger, this should be done, combined immediately or subsequently with partial gastrectomy. Where the ulcer cannot be excised removal of the pyloric end is nevertheless indicated. This method of treatment has been adopted in several cases with complete relief of symptoms, and definite radiographic evidence of cure of the ulcer.

No reference has been made to the actual cause of the pain, since this is outside the scope of the article. If, as is probable, it is due to irregular muscle tension and abnormal intragastric pressure (in the absence, of course, of penetration of surrounding structures), a partial gastrectomy must correct both, as it produces immediate relief of symptoms. Relief of symptoms, however, does not necessarily imply cure of the ulcer,

as shown by the cases of hæmorrhage and perforation which occur after gastro-enterostomy has produced complete relief of symptoms. For this reason special emphasis has been laid here upon the actual cure of ulceration and prevention of recurrence rather than upon the mere relief of symptoms.

I wish to acknowledge my indebtedness to Mr. E. Crook, surgical registrar, Charing Cross Hospital, who has taken infinite pains in the collection of the statistics and the carrying out of post-operative inquiries; to the staff of the Institute of Pathology for their chemical (Dr. J. Patterson) and pathological (Dr. A. B. Rosher and Dr. Berry) investigations, and to Dr. Russell Reynolds and Dr. Cochrane Shanks for the radiographic work.

THE STANDARDISATION OF SCARLET FEVER ANTITOXIN

BY CLINICAL METHODS.

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THERE are four methods in use for the standardisation of the scarlatinal streptococcic toxin and antitoxin. Three of these are clinical tests for which the human volunteer is necessary; the fourth is a method, recently described by Parish and Okell, which tests the potency of scarlatinal antitoxin in protecting rabbits against the intravenous injection of whole cultures of *Streptococcus scarlatinæ*. Laboratory animals are relatively insusceptible to the toxin of *S. scarlatinæ*, and this last method, while it serves to "differentiate efficient therapeutic sera from inefficient," lacks the accuracy with which the dosage of diphtheria antitoxin, for example, may be estimated. Whereas 0·002 c.cm. of diphtheritic toxin is an average lethal dose for a guinea-pig, 20–40 c.cm. of scarlatinal toxin, representing 500 times the quantity of toxin which will produce the scarlatinoid syndrome in man, are required to kill a rabbit. Nevertheless, any laboratory method which may compete in accuracy with the clinical tests for the standardisation of scarlatinal antitoxin must be the method of choice for various reasons. The tests can be carried out by competent technicians in the laboratory where the toxin and antitoxin is being prepared; the supply of animals is not limited like the number of human volunteers, and the individual variability is probably much less in the rabbit than in man.

The three clinical methods by which standardisation of scarlatinal antitoxin may be attempted are: (1) by the utilisation of the Schultz-Charlton phenomenon; (2) by passive immunisation; and (3) by the so-called skin method. It is proposed to give a short description and discussion of the results obtained from the use of these methods, and to discuss shortly their relative merits and limitations.

The Schultz-Charlton Test.

The serum of an individual convalescent from scarlet fever, or artificially prepared scarlatinal antitoxin, injected into the skin of scarlet fever patients while the rash is still bright, causes a blanching of the skin at the site of injection. In the application of this phenomenon to the diagnosis of scarlet fever (using a 1 : 10 dilution of antitoxin) a positive reaction is evidence of scarlatina, but a negative result does not quite exclude the infection, since some scarlet fever rashes are not blanched. Moreover, the test is least reliable where its use is most indicated—namely, in faint and otherwise atypical eruptions. It has, however, a useful application in the standardisation and comparison of scarlatinal antitoxins.

Method.—In the performance of the test dilutions of 1 : 1000 to 1 : 32,000 of the sera were used, since an antitoxin which does not cause blanching in a dilution of 1 : 1000 is of little therapeutic value. Children of 5 to 15 years with bright finely punctate rashes gave the best results; the abdomen is the most suitable site for the tests, and 0·4 c.cm. of the serum dilution was found to be an appropriate dose for injection. Usually four tests were done on each patient: two different antisera were compared, and two dilutions of each were used. If, for example, a dilution of 1 : 4000 but not 1 : 8000 of antitoxin A causes blanching, and a dilution of 1 : 8000 of antitoxin B causes blanching, the antitoxins can be standardised, and it is established that serum B has double the therapeutic value of serum A. Two sera S.A. 4571 and S.A. 4462 in dilutions of 1 : 1000, 1 : 8000, and 1 : 16,000 were tested. Antitoxin S.A. 4571 gave uniformly positive reactions in dilutions of 1 : 1000 and 1 : 8000, but two only out of eight cases tested were positive with a dilution of 1 : 16,000. S.A. 4462 produced blanching in a dilution of 1 : 1000 with all cases, but only four out of sixteen and none out of eight patients when tested with dilutions respectively of 1 : 8000 and 1 : 16,000 gave positive reactions.

Passive Immunisation.

To standardise and compare antitoxins by the passive immunisation of susceptible subjects one of two methods may be adopted: either (*a*) find the smallest dose of antitoxin which will render a Dick-positive reaction Dick-negative in 24 hours in a patient accidentally exposed to the risk of infection; or (*b*) determine the duration of immunity conferred by the injection of a standard amount of the antitoxin. The second method was used: 2·5 c.cm., 5 c.cm., and in a few cases 10 c.cm. of the serum was injected intramuscularly into patients who had given definite Dick-positive reactions; these individuals were then Dick-tested at regular intervals of time (24 hours, 5, 8, 13 days), until they again became Dick-positive. For comparison of the two antitoxins, the test-subjects were as far as possible children of the same age, giving Dick reactions of equal intensity. Even then, a lack of uniformity in the results may be expected, for the amount of scarlatinal antitoxin already present in the blood is probably not the same for any two individuals. For instance, the injection of 5 c.cm. of antitoxin may protect one child for two weeks, while an equal amount of the same antitoxin may protect another child with less natural antitoxin for one week only.* Table I. briefly summarises the results obtained.

TABLE I.—*Duration of Immunity with* (A) *2·5 c.cm. and* (B) *5 c.cm. Antitoxin.*

1. *Antitoxin A.4501.*

A				B			
Cases.	Time after inject.	Dick pos.	Dick neg.	Cases.	Time after injec.	Dick pos.	Dick neg.
16	24 hrs.	1	15	8	24 hrs.	0	8
	5 days.	2	14		5 days.	0	8
	8 "	11	5		9 "	3	5
	12 "	16	0		13 "	6	2
					17 "	7	1

2. *Antitoxin A.4462 E.*

A				B			
16	24 hrs.	0	16	14	24 hrs.	0	14
	5 days.	4	12		5 days.	0	14
	8 "	14	2		9 "	4	10
	12 "	16	0		13 "	11	3
					17 "	14	0

The Skin Method.

The test subjects for this method of standardisation must be, as in the passive immunisation method, susceptible to scarlet fever, and must give a Dick reaction of at least 20 mm. diameter with five skin-test

* The utility of passive immunisation in affording immediate protection to susceptible individuals exposed to scarlet fever has been discussed elsewhere (Cruickshank, Glasg. Med. Jour.). It may be said that in general 2·5 c.cm. of a concentrated antitoxin protects for 3–6 days, 5 c.cm. for 7–10 days, and 10 c.cm. for 2–3 weeks.

doses of toxin. In hospital, patients convalescent from diphtheria and chicken-pox, and accidentally exposed to the risk of infection, were found most suitable for the purpose.

Method.—Measured volumes of the toxin diluted to contain ten skin-test doses in 0·2 c.cm. were mixed in vitro with equal quantities of antitoxin in dilutions of 1 : 100 to 1 : 1000. After standing at room temperature for one hour, 0·2 c.cm. of these toxin-antitoxin mixtures—each containing five skin-test doses of toxin—was injected intradermally; a control test with toxin alone was also done. The mixture which reduces the reaction from 20 mm. in size to less than 10 mm. contains sufficient antitoxin to neutralise five skin-test doses of toxin. The "therapeutic dose"—the amount of antitoxin required to neutralise 20,000 skin-test doses of toxin (Dick and Dick)—can be readily calculated. Two sera, S.A. 4627 and S.A. 4565, were compared. The preliminary dilutions were made with graduated 1 c.cm. pipettes, a separate pipette being used for each antiserum and for the toxin, and again separate syringes were used for the intradermal injection of the different mixtures. The abdomen is the site of choice, since half a dozen or more tests can be done simultaneously and the reactions are more definite and measurable there than on the arms.

The results given in Table II. indicate that the "neutralising" dilution of antitoxin is 1 : 100.

TABLE II.—*The Skin Reaction to the Intradermal Injection of Toxin plus Varying Dilutions of Antitoxin.*

Size of Reaction in mm. Measured in Two Diameters.

Dilution of antitoxin.	S.A. 4627.		S.A. 4565.		Toxin control. 24 hrs.
	24 hrs.	48 hrs.	24 hrs.	48 hrs.	
1 : 1000	26 : 31*	30 : 33	16 : 20	25 : 25	32 : 40
1 : 800	17 : 23*	17 : 17	14 : 17	17 : 19	21 : 26
1 : 400	15 : 23*	18 : 23	10 : 13	15 : 21	24 : 27
1 : 200	14 : 17*	22 : 25	11 : 16	17 : 17	34 : 37
1 : 100	—	15 : 15†	20 : 22†	20 : 25†	27 : 33

* Each of these figures represents the average of four separate reactions on four children.

† With 1 : 100 dilution of antitoxin only one case showed any reaction with both S.A. 4627 and S.A. 4565.

Discussion.

None of the three clinical methods under consideration gave results that were sufficiently delicate and uniform to merit recommendation as an accurate and reliable method of standardising scarlatinal antitoxin. This might a priori be expected, since the human subject varies within wide limits in his response to infection; the variation, where scarlet fever is concerned, is probably due, in part at least, to the variable amount of natural antitoxin in the blood of different individuals. The difficulty could be surmounted by taking the average of a large number of individuals, but unfortunately the supply of human volunteers is limited.

In a comparison of the tests, preference must be accorded to that method which is the most delicate and at the same time gives uniform results. In other words, a method which will distinguish between the neutralising power of dilutions of 1 : 100 and 1 : 200 of an antitoxin, or between the antibody content of 2·5 c.cm. and 5 c.cm. of a serum, is preferable to a method which can only tell us that a dilution of 1 : 100 is more potent than one of 1 : 400 or 1 : 800, or that 10–20 c.cm. of a serum contains more antibody than 2·5 c.cm. The tables show that the results obtained by passive immunisation best fulfil the requirements, provided that the Dick test be repeated at four- to five-day intervals. Taking antitoxin A.4462E (Table I.), for example, if the patients were Dick-tested only 24 hours after injection of the serum it would be impossible to distinguish between the protective values of 2·5 c.cm. and 5 c.cm., but eight days afterwards, 14 out of 16 individuals receiving 2·5 c.cm. were again Dick-positive, compared with four only out of 14 receiving 5 c.cm. of antitoxin. Unfortunately the passive immunisation method requires a prolonged observation of the test subjects with repeated Dick tests, and, in addition, the injection of serum, which may not be without attendant risks in a sensitised individual. The Schultz-Charlton test can be carried out only on patients with bright scarlatinal rashes. Apart from the small percentage of cases which fail to react to the test, the method gives results which are fairly uniform and delicate.

The skin method, in our hands, failed to differentiate a dilution of antitoxin of 1 : 800–1 : 1000 from a dilution of 1 : 200, so that on the standard of delicacy it failed. The method has certain advantages, however, in that it is fairly easy, the tests are done on susceptible subjects, who require to be under observation for two days only, and the results obtained were more uniform and clean-cut than with either of the two previous methods. It is the method recommended by Dick and Dick, and has been adopted as the official method of standardising scarlatinal antitoxin by the Hygienic Laboratory of the United States Public Health Service.

If these clinical tests be compared with the laboratory test of Parish and Okell, they appear to have some advantage in the differentiation of the relative therapeutic values of scarlatinal antitoxins, but the drawbacks to the clinical tests are such as to give the laboratory test the preference as the method of choice. It must not be supposed, however, that any of the methods at present available is sufficiently accurate to allow a uniformity in the dosage of scarlatinal antitoxin in any way approaching that of diphtheria antitoxin.

I am indebted to Dr. R. A. O'Brien, of the Wellcome Physiological Research Laboratories, for suggesting this piece of work and for advice throughout its course. Most of the material was supplied directly by him.

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ÆTIOLOGY OF HYPERPIESIS IN EGYPTIANS.*

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THE conclusions in this paper are based on a study of over 3000 cases, many of whom were traced for 10 to 15 years. All were seen in private practice, so that they were observed over a much longer period than is possible in a hospital; observations for short periods on a disease which seems to be lifelong are misleading, and give a false idea of its natural course.

Chronic primary hyperpiesis in the absence of chronic inflammatory renal changes is quite common in Egypt, and forms at least 10 per cent. of all cases in private clinics, but is rare in hospital practice. For four years, 1913–1917, not a single case was admitted, and in the following years only two genuine cases could be picked out. The disease is especially limited to the two decades 35–55, and is very rare under 30; the youngest patient was a student of 27 whose father and mother had both suffered from the disease, which appeared in him when he was 23. The condition is rare after 60, and the eldest patient was about 75. About 10 per cent. of the cases are females.

Out of 100 consecutive cases 37 were fellahin of the middle class, 17 were lawyers, judges, and mental workers, 10 were doctors, and 10 females; the rest came from clerical and other occupations, two being railway porters.

* Summary of several addresses given to Kasr-el-Aini Hospital Society and Egyptian Medical Society.

Diet, Nervous Influences, Toxins, and Infections.

That excess of food, especially protein, causes a hyperpiesia is undoubted. The rise is, however, temporary, and the pressure falls gradually and sometimes suddenly as soon as the intake is limited.

A young man of 30, weighing 72 kilos, developed pulmonary tuberculosis and was advised to over-feed. His blood pressure rose from an average of 100/75 to 200/100, and remained up for about six months, during which time his weight increased by 25 kilos. With limitation of diet and graduated exercise the pressure fell to 150/105 in the course of three months, and has remained there till now (three years).

Excess of diet plays a part in acute hyperpiesis in normal subjects or in extra rises (often temporary) in subjects of chronic hyperpiesia. That diet is certainly not the cause of the latter is shown by the fact that 40 per cent. of cases of high hyperpiesia were of normal weight or slightly under. Overfeeding and overweight is by no means always accompanied by rises of pressure, and in women of a certain class, especially at the climacteric, though overweight is common, less than one-fifth have hyperpiesia.

That strong emotional disturbance can cause marked rises of pressure is certain; the effect is, however, temporary, and in no single case was a permanent effect found.

A lady of about 50, previously in good health, with systolic pressure ranging from 120–140 for years, suddenly, after prolonged grief, complained of severe headache, congestion of the face, and asthmatic-like attacks at night. Blood pressure 310/160. No sign of local nerve lesion. Urea 30 mg. or 0·03 per cent. of blood; urine normal. Venesection and elimination treatment with bromides lowered the pressure to 200/100–240/110 in about six days, but the systolic pressure remained about 200 for at least two months in spite of treatment. On separation from her husband (apparently a great mental relief) the pressure fell to 120–150, and for the last year and a half there has been no return to the high figure.

Many similar cases were observed, and in all of them the pressure fell as soon as the nervous condition improved. Nerve storms are important causes of rise of pressure in normal subjects, of extra rises in hyperpietic cases, or even of onset. That they are not the sole cause is shown by the fact that fully one-third of the cases occurred in placid men and women of the middle class with sedentary habits, many of them unable to read or write and having no special complaint. Conversely, hyperpiesia does not necessarily follow emotional states.

That certain substances absorbed from the alimentary tract have a pressor action has been shown experimentally, and some—e.g., isoamylamine, P-hydroxy, phenylethylamine, and phenylethylamine—have been isolated. These and similar substances may be operative in acute cases of hyperpiesia, as shown by the rapid fall of blood pressure (often permanent) on elimination treatment and starvation. In chronic primary hyperpiesia the blood pressure is affected very little if at all by any method of treatment. Formerly, hyperpiesis was looked upon as an untoward sign in all cases, and every effort was made to lower it, including rest in bed for months at a time, repeated venesection, repeated doses of calomel and salines, and strict lacto-vegetarian diet with two starvation days per week. It soon became clear that the resulting fall was slight, and in some cases the pressure actually rose during the treatment—showing conclusively that the rise was not due to absorbed toxins, the amount of which should have been diminished by a very restricted régime.

A railway inspector was seen on several occasions in 1919 with average blood pressure 170/80 and nervous symptoms (fatigue and insomnia) suggesting neurasthenia. With absolute rest in bed and milk diet the symptoms markedly improved, but the blood pressure rose to 220/100. The patient remained in perfect health, and for the next three years his pressure ranged from 200–220. Since then nothing has been heard of him.

The course taken by chronic hyperpietics is a continuous one with few intermissions (extra rise or fall), which would certainly not be the case were the rise due to absorption of toxins, the amount of which would be subject to continuous variations. Again, toxins, whatever their nature, would give rise to other symptoms besides hyperpiesis, but these patients continue generally for years without any symptoms at all; some have been traced for 15 years and some, with a reliable medical history, for 25 years. Occasional symptoms, such as headache, giddiness, dyspnœa, or asthmatic attacks, can be easily shown to have no relation to the chronic malady. They bear no relation to the degree of hyperpiesis, and often occur without extra rise of the blood pressure, and in some with a relative fall. They can be relieved by eliminative treatment, which does not affect the height of the blood pressure, for this is in many cases higher after treatment than before. These symptoms are due to absorption of substances with a pressor or a depressor effect, and have no relation to the original disease.

An example is afforded by a patient with severe headache following trephining for chronic glaucoma, unexplained by the eye condition. The blood pressure varied from 220/110 to 230/130, and remained approximately at the same height for six weeks; with blood-letting, elimination, and starvation it dropped at times to 200, but the headache did not disappear. Finally the headache disappeared spontaneously, but the pressure has remained at about 240/140, with occasional rises, until now (2½ years).

Graver and more permanent symptoms which occur in hyperpietics are due to arterio-sclerosis or its complications, and not directly to the hyperpiesis. Much, however, may be said in support of the view that arterial disease is secondary to the increased pressure.

Syphilis, at times suspected as a cause, certainly has no relation to the disease; repeated courses of bismuth, mercury, and arsenic will change a positive Wassermann to negative without changing the pressure. Temporary rises of pressure occur in syphilitic subjects, as in normal subjects, but that has no relation to the chronic malady.

A history of old infectious fever (typhoid, malaria) is quite common, but so high is the incidence of both the infectious fevers and hyperpiesia that no causal relation between them can be established. A notable feature is the absence of ankylostoma and pellagra, and, to a lesser extent, of bilharzial infection, diseases which are very common in hospital class patients, in whom hyperpiesia is almost non-existent.

Alcohol as a cause can easily be dismissed, as the majority of patients had never tasted it. Tobacco seems to lower the tension, and some of the marked hypotensives were heavy smokers (over 40 cigarettes daily). Excess of coffee seems to be responsible for temporary rises of pressure in normal individuals and hyperpietics. No causal relationship can, however, be drawn between the amount of coffee taken and the degree of hyperpiesis. Some of the marked hypotensives were patients who consumed 40 cups daily (4·0 g. caffeine) for years, and fully one-third of all cases of hyperpiesia drank no coffee, or less than 10 cups daily (1·0 g. caffeine).

The Family History.

The disease is hereditary and social, and in many cases familial. In 100 consecutive cases 72 had a history in the father or mother, brothers or sisters, uncles or aunts, suggesting death from one of the complications of the disease—e.g., a hemiplegia or death suddenly after a meal (angina pectoris) or an attack of dyspnœa or fatal epistaxis. This generally occurs in the fifth and sixth decade, and is well known amongst the middle class, who are the chief sufferers, and often a man will come for examination for no other complaint than that his father or mother died from or was affected with hemiplegia.

In some cases notable family histories occur—e.g., a merchant in Upper Egypt (Mallawy), aged 55, seen a year ago. His blood pressure ranged from 180/100 to 200/120. His father died about the age of 60 with coma and hemiplegia; his mother died, when over 60, with hemiplegia. Three brothers, aged respectively 50, 48 and 44, all showed pressures between 160 and 200 on several occasions.

Another marked example was that of a merchant affected with the disease, whose father, mother, two sisters, and four

brothers were all affected (except one brother who had rheumatic endocarditis).

As a control the family history of 100 consecutive cases of other ailments was taken, and only 25 per cent. gave a history of father or mother being affected with symptoms suggesting hyperpiesia.

The Relationship between Hyperpiesis and Diabetes.

In families where only one member is affected with hyperpiesis, a clear history of diabetes is often given, and sometimes some members of a family are affected with diabetes, some with hyperpiesia, and some with both. The relation between diabetes and hyperpiesis is very close. Both are diseases of the middle and upper classes, and very rare in the poor-class hospital patient. Both run a very long course, and for years there may be no symptoms in the absence of complications. The chief age of onset in both diseases is from 30–40, and the duration of both is approximately the same. The majority of hyperpietics die in the 'fifties and 'sixties; diabetics, having better treatment, generally die in the 'sixties or 'seventies. The age of onset and duration account for the rarity of hyperpiesia above 65 and of diabetes above 75. Amongst several thousands of hyperpietics seen in 15 years I can only recall nine cases above 65, including two between 70 and 80. The same statement holds good for diabetics, if allowance is made for slightly increased longevity. Both diseases run their course in spite of any treatment. This is certainly true of hyperpiesia, and was true of diabetes before the days of insulin and regulated diet. Except in acute crises treatment of hyperpiesia is useless, and at times dangerous; the rise of pressure is certainly compensatory. Attempts to lower the pressure by venesection, elimination, vaso-dilators, diet, &c., were in the majority of cases unsuccessful, and in those in whom it was lowered temporarily symptoms arose (cerebral, renal or cardiac), apparently due to the anæmia which only disappeared on resumption of previous habits. The patient has to choose between a slightly prolonged and restricted life and a useful, apparently normal, short one, often terminated suddenly by fatal cerebral hæmorrhage, angina or uræmic-like symptoms. I certainly do not agree with Clifford Allbutt when he says: "If we catch hyperpiesis early and keep at work against it, it can be cured more often than not."[1] Hyperpietics who do not die from complications end with uræmic-like symptoms of auto-intoxication, analogous to diabetic coma. The similarity is so great that I surmise that hyperpiesis is due to a metabolic disturbance (dyscrasia), often inborn and hereditary. Nothing is known about the relation of this disorder to ductless glands. A full trial of thyroid and parathyroid was made for months, and sometimes for years, in suspected cases, and the results, though encouraging in a small number, can only relate less than 2 per cent. of all cases to deficiency of internal secretions. One thing seems certain, and that is the relation of the hyperpiesis to the metabolic change; the rise of pressure is entirely compensatory, and as long as the pressure is relatively sufficient no symptoms arise, and the individual enjoys normal habits. Only when the pressure begins to fall do symptoms appear referable to the metabolic dyscrasia.

[1] Clifford Allbutt, Diseases of the Arteries, vol. ii.

WESTERN OPHTHALMIC HOSPITAL, MARYLEBONE, AS A "DANGEROUS STRUCTURE."—This hospital has been served with a "dangerous structure" notice by the district surveyor of Marylebone on the ground that the building "might collapse at any moment like a house of cards," and its demolition has been begun. Great difficulty has been experienced in finding accommodation for the patients, 18 of whom are awaiting operation. The hospital is an old Georgian building in the Marylebone-road, very cramped and inconvenient, with wards the size of small bedrooms. The operating theatre is only a few feet square with a floor of rough boards, and a roof which leaks in wet weather; there are no facilities for moving patients after operations. A rebuilding scheme to cost £40,000 was prepared some time ago, and £23,000 has so far been collected.

Clinical and Laboratory Notes.

A NOTE ON BLOOD CHANGES ASSOCIATED WITH LIVER DIET IN YOUNG CONVALESCENTS.

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IN order to find out whether the blood changes obtained with liver diet in cases of pernicious anæmia were confined only to that disease, it has been thought worth while to study the blood changes produced by the same diet in hospital patients free from any blood disease. Whereas the original work of Whipple indicated that liver diet was likely to be useful in all forms of anæmia, the first recorded results with liver diet in pernicious anæmia suggested that it was most specific for pernicious anæmia and exerted its maximum effect only in that disease. Recently it has been found by Vaughan [1] and others that some cases of secondary anæmia respond to liver treatment, and we have found that relatively normal children show a transient but definite stimulatory response to liver feeding.

The 11 cases selected for treatment in this investigation were between the ages of 3 and 15 years with the single exception of one girl aged 19. The majority of the patients were in surgical wards and were, during the experimental period, convalescing from such surgical conditions as inguinal hernia, tuberculous adenitis, and submaxillary abscess; others were in medical wards under treatment for such diseases as mediastinal adenitis and oxaluria. On account of the special interest attaching to the blood changes observed in them two cases are included in which the lymphatic system seemed principally affected; these were cases diagnosed as Hodgkin's disease and glandular fever.

Fresh cooked liver was given daily, the amount varying with the age of the patient; the older patients received 3 oz. daily and the younger ones 2 oz. A blood examination was made in every case before starting the diet and the feeding was continued for periods varying between six and 40 days. In the first few cases examinations were made at intervals of three or four days for a period of three weeks, but experience showed that the maximum effect was noticeable after about six days and that it declined thereafter. In no case was hæmatinic drugs given during the time of liver feeding.

The table shows the results with the 11 patients. In most cases the changes in red and white cell counts and in the hæmoglobin percentage have been included, whilst the alteration in the differential leucocyte count are recorded in all. The last two columns show the variations in the granular and non-granular cells in order to contrast the changes in bone-marrow cells with those taking origin from some source other than the bone-marrow. Such observations as were made on the red cells and hæmoglobin show that these tended to increase. A leucocytosis was produced in seven out of the 11 cases. In seven cases also there was an increase in the relative and absolute number of polymorphonuclears. Neither the increase in the total leucocytes nor the increase in polymorphonuclears was maintained for longer than ten days. Lymphocytes showed a relative but not absolute reduction in nearly all cases. A definite absolute increase in eosinophils was produced in all instances, the striking figure of 61 per cent. being found in the case of Hodgkin's disease. An increase in granular or bone-marrow cells was also the rule.

[1] Vaughan, Janet: THE LANCET, 1928, i., 1063.

These results show that the administration of liver to patients who suffer neither from pernicious anæmia nor any other blood disease produces alterations in the blood comparable to those occurring in the treatment of pernicious anæmia. An interesting feature of the series is the eosinophilia which has been also found in pernicious anæmia by one of us (L. E. H. W.),[2] and in secondary anæmia by Vaughan.[1] The definite increase in the red cells and bone-marrow leucocytes shows that liver must exert a stimulating action on the bone-marrow. It is difficult to believe that stimulation is the only action in pernicious anæmia though evidently it is one essential feature.

We are inclined to suggest that liver is rich in a substance essential for the proper functioning of the bone-marrow; in pernicious anæmia, this substance, whatever it may be, is not absorbed in sufficient quantity from an ordinary mixed diet, perhaps on account of the achlorhydria, though it is possible to assimilate enough with massive liver feeding.

Case.	Age.	Disease.	Dose in oz.	Days after feeding started.	Blood changes: Red cells in millions; leucocytes in thousands (absolute figures).							
					Red cells.	Hb.	Leucocytes.	Polymorphs.	Lymphocytes.	Eosinophils.	Cells. Granular.	Cells. Non-granular.
1	3	Submaxillary abscess.	2	6	4·85→5·75	66→66	7·6→20·0	2·4 → 8·6	4·4 → 9·0	0·095→ 0·8	2·6 → 9·4	5·07→10·6
				9	4·8	66	16·4	6·5	7·85	1·2	7·6	8·8
2	7½	Cervical adenitis (T.B.).	2	6	5·3 →6·1	80→82	8·2→21·5	3·6 →12·0	3·9 → 7·5	0·05 → 0·7	4·1 →12·8	4·1 → 8·7
				9	6·3	84	10·6	5·95	3·5	0·6	6·5	4·1
				10	6·8	86	4·9	2·1	2·5	0·1	2·3	2·6
3	3½	Submental abscess.	2	6	5·3 →6·2	72→78	4·3→28·6	2·4 →16·9	1·5 → 9·4	0·1 →10·0	2·55→17·9	1·75→10·7
				13	4·95		23·0	10·9	10·4	8·0	11·7	11·3
4	6	Hernia.	2	6	—	—	6·5→10·2	3·9 → 6·45	2·45→ 3·06	0 → 2·5	3·9 → 6·5	2·6 → 3·7
5	7	Mediastinal glands.	2	6	—	—	19·2→11·4	9·6 → 5·4	8·8 → 3·9	0·02 → 0·47	10·2 → 5·9	9·0 → 4·5
6	5	Tuberculous lymphadenitis.	2	7	—	—	11·8→11·4	8·1 → 7·5	3·1 → 2·9	0·2 → 0·6	8·4 → 8·2	3·4 → 3·2
7	9½	Oxaluria.	3	8	5·04→5·8	—	7·4→ 5·6	3·3 → 3·2	3·3 → 1·5	0·5 → 0·6	4·0 → 3·8	3·4 → 1·8
8	19	Fragilitas ossium.	3	10	—	—	7·8→13·0	4·4 → 7·0	2·6 → 4·4	0·05 → 0·9	4·8 → 7·9	3·0 → 5·1
9	14	Mitral stenosis.	3	15	—	—	16·2→16·8	7·8 → 9·6	7·6 → 5·5	0·4 → 0·5	8·1 →10·0	8·1 → 6·8
10	15	Glandular fever.	3	8	4·7 →5·59	75→78	9·8→12·8	4·85→ 6·7	4·2 → 5·1	0·2 → 0·6	5·2 → 7·2	4·6 → 5·6
11	9	Hodgkin's disease.	3	18	3·1 →3·9	65→66	18·6→21·4	15·4 → 3·6	2·6 → 3·5	0·06 →13·0	15·6 →16·6	3·0 → 4·8
				21	4·09	74	16·8	3·4	4·7	8·0	11·6	5·2
				40	3·9	66	14·0	2·8	3·1	3·4	10·4	3·6

We are indebted to Dr. C. E. Lakin, Dr. E. A. Cockayne, and Mr. E. L. Pearce Gould for the clinical material.

[2] THE LANCET, 1928, i., 285.

A COMPARISON OF THE "TITANIUM RAY" WITH THE METALLIC TUNGSTEN ARC.

BY B. D. H. WATTERS, M.SC.

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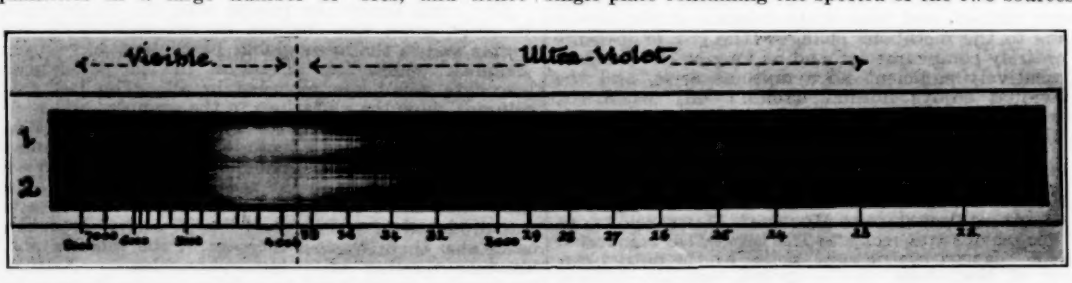
CONSIDERABLE interest has been aroused recently by a new arc designed for therapeutic work which is termed the "titanium ray." The arc is formed between metallic electrodes which consist of a tungsten alloy containing, it is claimed, approximately 4 per cent. titanium.

Titanium is a rare metal which occurs in small quantities in a large number of ores, and hence is often present in different metals as an impurity. The characteristic arc spectrum of the metal has a number of intense lines in the ultra-violet region. Samples of the electrodes supplied for generating this arc were obtained and the arc spectrum tested by means of a Hilger quartz spectrometer. For purposes of comparison, the spectrum given by metallic tungsten of the quality used in therapeutic work was included on the same plate. The photograph of the two spectra is shown in the illustration, and it will be seen that they are practically identical both in the range of the ultra-violet and the distribution of the intensity. Detailed examination of the plate under a low-power microscope shows certain minor lines as more intense in the "titanium ray" spectrum than in that given by commercial tungsten. These variations are, however, so slight that the difference in the quality of the radiation from a therapeutic point of view must be considered as negligible.

The print reproduced here was obtained from a single plate containing the spectra of the two sources.



The upper spectrum (1) is that of the "titanium ray" and the lower (2) is that of the tungsten arc. Exposure in each case 30 seconds. (Photographed on an Ilford Process Plate.)

An incandescent filament lamp was used for printing, and the distance of the lamp from the plate was adjusted so as to bring out the full range of the radiations.

A further test was made of the intensity of the radiation from the two arcs judged by the production

of erythema on the skin. Two small areas of skin close together on the forearm were exposed consecutively to the arcs running under identical conditions as far as could be done. (Current, 6 ampères; P.D. across electrodes, 58 volts; voltage of supply drawn from a bank of large accumulators, 120 volts.) Three distinct pairs of exposures were made on different days and in each case the erythema produced by the "titanium ray" and the tungsten arc could not be distinguished in depth of coloration and the latent period between the exposure and the appearance of the reaction was the same.

It has been stated that the "titanium ray" is more penetrating than other sources of ultra-violet light, but, judging from the evidence of the experiments described above, the penetration of the radiation can be no different from that of other sources with a similar spectral distribution.

A CASE OF
ABSCESS OF THE HEART CAUSING DEATH THROUGH CORONARY HÆMORRHAGE.

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A case of abscess of the heart apparently resulting from staphylococcal infection of the skin, and without evidence of general pyæmia, is so rare that its description seems to be justified. Not only is the occurrence uncommon, but in the case reported death was due to rupture of the abscess into one of the coronary arteries and the pericardial sac, giving rise to a condition which simulated, and was at first mistaken for cardiac rupture.

The Case Described.

A married man, aged 57, was admitted to hospital under certificate on Jan. 30th. Previous to certification he had been in poor health for some time and his latest occupation had been the somewhat arduous one of labourer. During his multifarious pursuits—principally as soldier and stoker—he had contracted malaria in Upper Burma and suffered from sunstroke in India many years previously. His condition on admission, however, was not thought to be consequent on these misfortunes. His personal history, as related by his wife, showed him to be a man of temperate habits who, four years previous to admission, became weak, was subject to numerous boils and carbuncles, and developed tremors of the legs.

On admission he exhibited many old scars, the result of boils and carbuncles in the region of the back and legs, but only one scar on the upper part of the body, and that on the right shoulder. His chest was fairly well covered, but the excursions on respiration were limited. No abnormality of the lungs was apparent on percussion, but on auscultation râles and rhonchi were heard to such an extent that the heart sounds were obscured. The apex-beat was 2 in. outside the nipple line, and the left border of the heart was found in a corresponding position. His arterial system, as judged from palpation of the radial artery, exhibited marked atheromatous and senile changes. He was very unsteady on his legs and walked with a very wide gait, and on examination of his reflexes it was found that his knee-jerks were very brisk and exaggerated.

As the mental disturbance has no bearing on the point under consideration, a detailed account of his psychosis can be omitted. It is considered only sufficient to state that although his memory was greatly impaired, he suffered from no delusions or hallucinations, and he was capable of appreciating pain or distress and communicating his sensations to those in attendance.

On Feb. 18th he developed a large carbuncle over the right trochanter, was put to bed, and received appropriate treatment in the form of free drainage. The carbuncle responded well to treatment, but three days later (Feb. 21st) a boil appeared on the left hip. This, however, had healed by March 7th, but the original area, although clean, had not closed. On March 12th another carbuncle appeared on the right buttock and several others appeared in a few days in the region of the hips, buttocks, and sacrum. On the evening of March 30th the patient conversed as usual with the medical officer and complained of no unusual symptoms, but at 12.5 A.M. on the following day it was reported that he seemed to have had a "seizure" and had collapsed. When seen by the medical officer he was found to be in extremis, and despite treatment he died at 12.20 A.M.

The Wassermann reaction of the blood and cerebro-spinal fluid was negative.

Post-mortem Findings.

At autopsy marked atheroma was apparent in all areas of the body with consequent cerebral softening; enlargement of the cerebral ventricles and increased submeningeal fluid.

The heart was enlarged, weighing 530 g., and showed marked myocardial hypertrophy with fatty degeneration; these latter pathological changes were most apparent in the left ventricle. The cardiac valves appeared normal, apart from slight atheromatous changes, and gave no evidence of vegetations or acute inflammation. The pericardial sac was filled, but not distended, with a soft blood-clot and a small tumour in the region of the great vessels. The tumour formed a small protuberance ¼ in. in diameter and projected about ¼ in. from the surrounding heart wall. It was found on examination to be softer in consistency than the normal muscle, and one small channel was discovered through which a probe could be passed into the right coronary artery ¼ in. from its origin in the sinus of Valsalva. On making a cross-section of the growth a loculus was encountered containing about 1 c.cm. of pus; unfortunately, no culture media was at hand and the nature of the causative organism remains in doubt.

All the other organs of the body were carefully examined and no evidence of pyogenic infection was discovered other than the cutaneous lesions already described, and pyorrhœa alveolaris. The viscera, apart from the lungs which were passively congested, showed degenerative changes subsequent to the impaired blood-supply brought about by the atheroma.

It is presumed that the condition was one of multilocular abscess (carbuncle) of the heart wall in which the pus had tracked, in one of the loculi, in two directions—to the coronary artery and to the pericardial surface of the heart. In this manner a channel had been formed through which the blood had flowed into the pericardial sac, producing a mechanical resistance to an already greatly weakened heart and so caused death.

I wish to express my thanks to Colonel S. C. Elgee, medical superintendent of Cane Hill Mental Hospital, for permission to publish this case.

Public Health Services.

THE HEALTH OF LONDON IN 1927.

Dr. F. N. Kay Menzies, in his report on the County of London for the year 1927, explains that in recent reports the general public health services have been extensively dealt with, and that in the present instance he has devoted more attention to the school medical service, which, "joining hands with social agencies, is more intimately in touch with the domestic lives of the people, and in this way exercises a material influence on the general public health."

General Health Services.

Statistics.

The Registrar-General's estimate of the population was 4,550,000, including 9000 non-civilians. The 73,263 births gave a birth-rate of 16·1 per thousand. In 1901, when the population was about the same, the births were 57,829 more. The death-rate was 12·1, as compared with 11·6 in the previous year, and the increase was almost entirely due to the influenza epidemic at the beginning of the year, which caused an increased mortality at the higher ages. Fatal street accidents caused 669 deaths as compared with 656 in the previous year, but the deaths of children under 15 were 14 less. The weather favoured infant life, and a decreased mortality from diarrhœa produced an infant mortality-rate of 59, the lowest ever recorded in London. The death-rate from phthisis was 0·91; from all forms of tuberculosis, 1·05; from cancer, 1·49; from pneumonia, 1·0; from bronchitis, 0·83; from pneumonia, bronchitis, and influenza combined, 2·23; and from diarrhœa and enteritis under two years, 7·6 per thousand births, to be compared with 12·0 in 1926.

The table for the metropolitan boroughs, excluding the City, shows that the lowest infant mortality-rates were recorded in Holborn (38), in Woolwich (42), and in

Lewisham (46); while the highest were in Paddington (79), Chelsea (76), and Shoreditch (74). From phthisis, the lowest rates were in Hampstead (0·44), in Kensington (0·65), and in Paddington (0·67); the highest were in Finsbury (1.36), in Bermondsey (1·22), and in Holborn (1·21). The lowest rates from pneumonia were recorded in Woolwich (0·67), Wandsworth (0·67), Hampstead (0·70), Greenwich (0·73), and Battersea (0·73); while the lowest rates from bronchitis were in Chelsea (0·50), Hampstead (0·59), Stoke Newington 0·59), and Hackney (0·60). The lowest rates from cancer were in Holborn (1·18), Shoreditch (1·27), and Bethnal Green (1·29); while the highest were in Chelsea (2·21), Hampstead (1·86), and Kensington (1·84). The puerperal fever incidence per thousand births was 3·57 for London and varied much among the boroughs, being lowest in Deptford (0·53), Kensington (1·13), and Stoke Newington (1·37); and highest in Chelsea (8·2), Fulham (6·98), and St. Pancras (6·68).

Dr. Menzies points out that the mortality from puerperal fever is much lower in boroughs with poorer-class populations, than in those populated largely by the well-to-do. Thus in the years 1921–25 the rate in the aggregate population of Bermondsey, Bethnal Green, Finsbury, Stepney, and Shoreditch was 0·88 per 1000 births, as compared with 1·80 in the aggregate population of Hampstead, Kensington, Lewisham, Stoke Newington, and Wandsworth. In 1927 the mortality from puerperal fever in London was 3·22 per thousand births among single women, as compared with 1·15 among married women, while the rates from other accidents of childbirth were 2·93 and 1·46 respectively. The suggestion is made that the statistics of maternal mortality from childbirth should be given for legitimate and illegitimate births separately.

Small-pox.

There were 5 cases of small-pox in the county. One case was of the mild type and imported from the north of England. The other 4 cases were apparently connected with an outbreak in Hendon which took place in March to May from some unrecognised source. This outbreak included 13 cases, of which 7 were fatal, including 2 of the 4 London cases. The first case of this outbreak was a man of 47, vaccinated only in infancy and his illness was considered to be chicken-pox. As the result of this failure in diagnosis, clothes were sent to the laundry and further cases occurred among the laundry workers, 4 of which proved fatal.

Anthrax.

During the first week of January 4 cases of anthrax occurred in connexion with the Zoological Gardens. All of the patients had been engaged in handling the carcasses of two elephants which had died from an illness the nature of which was not recognised until after the men were infected. Anti-anthrax serum was promptly administered and all the patients had fairly mild attacks. A prophylactic dose of serum was also given to 29 persons who had been in contact with the carcasses and no further cases occurred.

Encephalitis Lethargica.

There were 149 notifications of encephalitis lethargica, of which 114 were considered to be true cases. Of these, 49 had proved fatal up to March 31st, 1928.

A table indicates the present condition as regards 528 cases of encephalitis which came under observation from 1925 to 1927. Of these, 132 under the age of 16 and 111 over the age of 16 are stated to have recovered. Since November, 1925, the M.A.B. have provided 100 beds for children between the ages of 3 and 16 suffering from the after-effects of encephalitis. At Winchmore Hill Hospital Dr. G. A. Borthwick, the medical superintendent, has recently reported that this experimental unit has not been productive of curative results, but has proved valuable for observation purposes. It has also housed children whose mental condition unsuited them for outside life. In most cases he considers that the nerve-cells have been irretrievably damaged, but in a minority it may be possible by patient endeavour to educate other cells to function in the place of those destroyed. While he cannot recommend the Board to continue the section as an experimental unit with curative hopes, the need for housing these difficult and pitiful cases may be sufficient justification for carrying it on.

Cancer.

An analysis is given of the deaths from cancer in London during the period 1911 to 1920. The deaths are divided into three groups. In group 1, comprising growths of the upper alimentary tract, the death-rate per million among males was 336 as compared with 46 among females. In group 2, comprising growths of the reproductive system, the female death-rate was 509 and the male rate 52. In group 3, which includes all other cancers, the sex-incidence was approximately equal. The excessive female mortality in group 2 is shown to occur at an earlier age than the excessive male mortality in group 1. Some of the conclusions drawn from this analysis are: (1) that among persons over 35 the movements of the cancer mortality from 1850 onwards are correlated with the year of birth and not with progressive changes in conditions of life; (2) that if this same correlation holds in the future, the female mortality-rate will continue to decline while the male rate will increase further for some time; and (3) that a cancer diathesis may be the dominating factor and that the solution of the cancer problem may ultimately be found to depend upon the detection and modification of such diathesis.

Tuberculosis.

During 1927 2305 samples of milk from 32 counties were taken at London railway termini. The bacteriological examination was completed for 1969, of which 154, or 7·8 per cent., yielded tubercle bacilli, as against 4·5 per cent. in 1926. Information was sent to the county medical officers of health and as a result 59 cows were slaughtered under the Tuberculosis Order. In the case of 311 of the samples, the inoculated guinea-pigs died from an acute infection, and notice of this was also sent to the medical officers of health on the chance of its being due to unsatisfactory conditions in the cowsheds. The conditions of patients who received residential treatment under the council's tuberculosis scheme are investigated after the lapse of five years. Adult cases treated in 1921, numbering 3178, were investigated. Of 468 pulmonary cases without tubercle bacilli, 83·5 per cent. were alive; of 330 early cases with tubercle bacilli, 61·5 per cent. were alive; of 1299 moderately advanced, 34 per cent. were alive; of 858 advanced cases, 3·7 per cent. were alive; and of 223 "surgical" cases, 73·5 per cent. were alive. The particulars as to children under 16 were as follows: Of 271 pulmonary cases without tubercle bacilli, 90 per cent. were alive; of early cases with tubercle bacilli, 44·5 per cent. were alive; of 18 moderately advanced, 50 per cent.; and of 33 advanced 3 per cent. were alive. Of the 189 children treated for non-pulmonary tuberculosis, 153 were alive, of whom 71 were at school and 58 at work.

In 1926 arrangements were made to try artificial light treatment in connexion with the dispensaries. The number of cases treated has been small but the results have not been encouraging, and it is suggested that the best results will only be obtained in residential institutions. The scheme, however, is to be continued for another year. With the help of the Invalid Children Aid Association, 146 children living in contact with advanced consumptives were boarded out in the country. The arrangements for residential treatment for children have been improved and there is now no waiting-list either for pulmonary or surgical cases.

Venereal Diseases.

The new cases of syphilis were 357 and the new cases of gonorrhœa 813 in excess of the figures for 1926. Although a number of patients still fail to complete the full course of treatment, the ratio of attendances has gone up to 40 per new case. The

number of non-venereal cases who present themselves for examination at the clinics has shown a steady increase. Thus in 1917 the non-venereal cases numbered about one-sixth of the venereal. In 1922 they numbered about one-third, and in 1927 they numbered more than one-half. The practitioners qualified for free supplies of salvarsan, &c., now number 446, as compared with 108 at the end of 1917.

School Medical Service.

The school report indicates a steady progress of the improvement programmes dealing with the reduced size of classes, improved desks, and sanitary conditions. There is even a revolt against desks altogether. Infant departments are already equipped with table and chairs instead of desks.

Rheumatic Children.

Dr. J. Nairn Dobbie has continued his investigations with regard to rheumatic children. His material was 100 cases admitted under the council's scheme to Carshalton or Highwood hospitals. Of these children, 79 were below the average in nutrition; while 19 showed no evidence of heart affection, 42 were "suspicious," and 39 definitely affected. The tonsils were seldom markedly enlarged; adenoids were not a noteworthy feature, and the children did not belong to the "catarrhal," but rather to the nervous type. Their educational attainments were below the average. In 44 cases the parents stated that the children had been "nervous" all their lives, and Dr. Dobbie favours the view that this nervousness is inherited. In 66 there was history of rheumatic incidence on the "immediate" family, and in only 23 was there no rheumatic family history. The homes of 35 were slums and of 53 more semi-slums. Dr. Dobbie's impression was that the actual dampness in most of the houses was of small degree. In the case of such homes the washing of clothes is done at the public baths. To sum up the environment: "It would appear that no one disadvantageous factor stands out, but rather that each and all of the concomitants of poverty, poor houses, dampness, unhealthy sites, overcrowding, lack of ventilation and of sunlight, poor feeding, poor clothing, irregular habits, &c., destructively converge on these unfortunate children, who wilt along the lines their bias carries them, be it marasmus, rheumatism, tuberculosis, or the respiratory diseases generally."

Nursery Schools.

A special report deals with nursery schools in London, Manchester, and Bradford. At the outset it is pointed out that the medical objections to a large school—e.g., the McMillan with an average attendance of 220—have been overcome. These schools are needed *most* for the *most* neglected children from the worst homes. There should always be some bathing accommodation and an open air régime. The social function of the school is twofold; it trains the children and by educating the mothers, raises the home life to a higher level. "The potential under dog, rebel, or anarchist can be recognised among the entrants to the nursery school, but it is seldom they are not transformed into orderly, active, and happy citizens of their community." Educationally, no attempt is made to teach the three R's, and the most profitable pursuits are rhythmic movements, speech training, and hand work. Special training is needed for the staff and there is at present a dearth of such training centres. To be drawn to the work is not enough. "The nursery school teacher must not only be a lover of children, but a knower of children as well, and a knower of all the factors that make for health, growth, and happiness." The nursery school must develop its own methods and create its own traditions, and must not be absorbed into elementary education until it is strong enough to reform the infant school from the bottom. The education of the younger pupils has hitherto suffered too much from academic and bookish traditions proceeding from the top.

Dr. Menzies takes exception to the statement of the chief medical officer of the Board of Education that London is an area without an orthopædic scheme. He shows that the council has not neglected its duty to the crippled children of London despite the disadvantage that it is not the local authority under the Maternity and Child Welfare Act. He also gives reasons to show that the percentage of children who leave the physically defective schools of a district wearing apparatus is not a satisfactory index of the efficiency of the district's orthopædic scheme.

Mr. Sowden Hills, inspecting dental surgeon, has completed a comparison of English and Jewish children as regards dental condition. About 7000 children were examined. He finds that up to the twelfth year there is no marked divergence, but that after this age the English boys show an increase in the amount of dental decay while the Jewish boys show a decrease.

MENTAL HOSPITAL REPORTS.

The *City of Leicester Mental Hospital* at West Humberstone had 941 patients on its books on March 31st, 1928. The ratio of mentally afflicted in Leicester is now 1:304; ten years ago it was 1:338. The recovery-rate for 1927 was 45·66 per cent. and the death-rate 6·31 per cent., figures which compare very favourably with the average for all public mental hospitals. Autopsies were held on 90 per cent. of those who died. Leave of absence was granted on 2870 occasions, and 52 per cent. of men and 37 per cent. of women patients have full or limited parole. Only 13 temporary and 3 permanent escapes resulted from this liberty. Small parties go out regularly for motor drives and to the cinema, and 78 per cent. of the patients are usefully employed. A cinematograph was installed in the recreation hall in the autumn. The old house of the medical superintendent has been converted into a female block; 32 new beds will be provided at the very low cost of £64 per bed. A new nurses' home is to be built. Two more members of the staff have obtained their M.P.A. certificate. A "Trinity" ultra-violet ray outfit has been installed in the X ray department. The pathologist reports on the malarial treatment of 12 more cases of general paralysis. Only one non-paralytic patient showed any improvement after induced malaria, but of 48 paralytics 25 per cent. have been discharged recovered and another 14·5 per cent. are "much improved." Reduction of the globulin and cell content of the cerebro-spinal fluid has been noticed, and in several cases the colloidal gold curve has changed to the luetic type. The investigation into the incidence of syphilis shows that of 218 males 7·5 per cent. and of 286 females 4·9 per cent. gave positive Wassermann reactions. The dental surgeon reports 347 operations, 99 inspections, and 27 refusals of treatment. All new admissions are inspected by him. The oral condition in general shows steady improvement.

The *City of Worcester Mental Hospital* at Powick housed 1056 patients at the end of last year. The discharge-rate was 43·52 per cent. and the death-rate 7·12 per cent. Post-mortem examinations were made in 65·75 per cent. of instances. The general health was good save for influenza and one case of erysipelas. Three babies were born in the hospital; two of the mothers have since been discharged. The new verandah for male patients fills a long-felt need, but the hospital still lacks clinical rooms, an admission block, and a convalescent villa. A continuous bath has been installed in one of the female wards. Thirty-three patients went out on trial, and 38 had parole within the estate. Six nurses obtained their M.P.A. certificate.

The *City of London Mental Hospital* at Stone, Dartford, had an active year in 1927. Of the 161 patients admitted 72 came on a voluntary basis. The recovery-rate was 30 per cent. for the certified and 40 per cent. for the voluntary patients. The death-rate was 5·86 per cent. There were 398 private and 246 rate-aided patients on the books at the end

of the year. There was not a single case of infectious disease, and the general health was good. Parties of rate-aided patients were sent to the seaside. Tiresome patients are now segregated in Newstone House, and the female infirmary ward has been divided so that recent admissions can be treated apart from other inmates. The new single rooms are furnished like ordinary bedrooms, and every possible parole is allowed. Two new wireless sets and two more ultra-violet ray lamps have been installed. The farm continues to supply all the milk, mutton, pork, eggs, poultry, and vegetables required for the hospital. A small dairy has been built and equipped. A difficulty in obtaining female nurses has now been satisfactorily overcome, and one more attendant has obtained his M.P.A. certificate. Fourteen men and 11 women nurses are now registered or certificated. The consulting staff now comprises a physician, a surgeon, a gynæcologist, an ophthalmologist, and an aurist. The Minister of Health visited the hospital in the autumn.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JULY 28TH, 1928.

Notifications.—The following cases of infectious diseases were notified during the week:—Small-pox, 149 (last week, 173); scarlet fever, 1641; diphtheria, 926; enteric fever, 83; pneumonia, 654; puerperal fever, 54; puerperal pyrexia, 84; cerebro-spinal fever, 8; acute poliomyelitis, 8; acute polio-encephalitis, 2; encephalitis lethargica, 28; continued fever, 1; dysentery, 5; ophthalmia neonatorum, 118. No case of cholera, plague, or typhus fever was notified during the week.

The cases of small-pox were notified in the following 17 counties: London, 3; Derby, 17; Devon, 3 (Plymouth); Durham, 38; Huntingdon, 1; Lancaster, 1; Leicester, 2; Norfolk, 2; Northampton, 2; Northumberland, 7; Nottingham, 5; Stafford, 11; Yorks, East Riding 6, North Riding 2, West Riding 23; Glamorgan 10; Monmouth, 15; and 1 at the Port of Southampton.

The number of patients in the Infectious Hospitals of the Metropolitan Asylums Board on July 31st–August 1st was as follows:—Small-pox, 19 under treatment, 1 under observation; scarlet fever, 1743; diphtheria, 1791; enteric fever, 39; measles, 323; whooping-cough, 194; puerperal fever, 18 (plus 11 babies); encephalitis lethargica, 71; poliomyelitis, 2; "other diseases," 20. At St. Margaret's Hospital there were 20 babies (plus 15 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox or enteric fever, 19 (5) from measles, 2 (1) from scarlet fever, 32 (5) from whooping-cough, 22 (3) from diphtheria, 53 (11) from diarrhœa and enteritis under two years, and 25 (7) from influenza. The figures in parentheses are those for London itself.

Of the 14 fatal cases of measles outside London, 9 were reported from Liverpool and 3 from Birmingham. Of the 27 fatal cases of whooping-cough outside London, 8 were reported from Liverpool, 5 from Birmingham, and 4 from Newcastle-on-Tyne. The deaths from diarrhœa were about 50 per cent. more than in the previous week.

The number of stillbirths registered during the week was 276 in the great towns (corresponding to a rate of 39 per 1000 births) including 39 in London.

Paralyphoid in the London Area.—The figures given above record a large increase over the previous week in the notifications of "enteric fever" and in the number of admissions under this head to M.A.B. hospitals. Since the return was made up upwards of 100 cases of paratyphoid B. infection have been notified in the London area, the cases for the most part being of a mild type, although one fatal result has been reported. The wide distribution suggests the infection of some common article of food, cream being under suspicion rather than the milk or water supply. The most intense centres of infection have been in Epsom and Kensington, although Wandsworth, Fulham, and Westminster have borne their share. The outbreak has been somewhat confused in the popular mind with a group of cases of food poisoning of a very different type among police officers in the Westminster area with a fatal case of toxæmia, in which death was presumed to have resulted from eating infected ham; the pathological report from King's College Pathological Laboratory confirmed this finding, but the inquest has not yet been concluded.

Reviews and Notices of Books.

THE PRESCRIBING OF SPECTACLES.

Third edition. By ARCHIBALD STANLEY PERCIVAL, M.A., M.B., B.C. Cantab. Illustrated with diagrams. Bristol: John Wright and Sons, Ltd. 1928. Pp. 239. 15*s*.

THIS book, which is written by an acknowledged authority on mathematical optics and on the minutiæ of spectacle prescribing, has been rewritten and enlarged. It contains much interesting matter besides the usual accounts of the optics of refraction and of the methods of testing the refraction of the eye. For retinoscopy the concave mirror is recommended on the ground that illumination is better than with the plane mirror; the author admits, however, that preference for one or the other form is to a great extent a matter of habit. The refraction of the macula can only be accurately determined in most cases with a dilated pupil, and this is specially important in myopia where the disc is liable to be tilted and the fundus stretched. For the accurate estimation of the angle of astigmatism the use of cylinders in retinoscopy is far preferable to the refraction of the two meridia by spherical lenses alone. Here the author mentions a point which is not generally known. When the correct cylinder in the trial frame is at the wrong angle the error, shown by the direction in which the shadow moves, is greatly exaggerated. This enables the surgeon to judge how to shift the axis of the cylinder until an equal shadow in all meridia is obtained. The ophthalmometer is not recommended for accurate work, since it only gives the astigmatism of the anterior corneal surface. Dr. Percival points out that tilting the lens downwards increases the spherical and still more the cylindrical power. This device may be of practical value in some cases of high myopia with astigmatism; also in prescribing temporary glasses after a cataract operation, the immediate effect of which is to cause some astigmatism with the axis horizontal. On the subject of periscopic spectacles Dr. Percival notes that the anterior convexity of a high plus lens is often too high. For instance, if a lens of +10D is to be made periscopically on a base of −7D, the anterior convexity should not be +17D but +16 D, owing to the distance from the eye. These and other details are worked out mathematically and the exact figures are given in tables. More than a third of the book is devoted to the application of mathematical optics to various practical problems in the prescribing and fitting of glasses.

FRACTURE OF THE PELVIS.

Beiträge zur Kenntnis der Beckenbrüche und Beckenluxationen. By ANDERS WESTERBORN. Upsala and Stockholm. 1928. Pp. 375.

THIS monograph is Supplement VIII. of Vol. LXIII. of the Acta Chirurgica Scandinavica and comes from the surgical clinic of the University of Upsala under the authority of Prof. Gunnar Nyström. The author wrote it in Swedish, and it has been translated into German by Dr. H. Flex. Dr. Westerborn, in his preface, states that since the introduction of X rays no thorough study of the subject has appeared and that a clinical rontgenological investigation of the material is required not only as regards the industrial efficiency of the surviving patients, but also as to their anatomical recovery and subjective symptoms. The author gives statistics of the causes of fracture in 278 cases as far as ascertainable; 143 of these were falls from a height (including eight cases of suicide by jumping out of window), 84 were caused by crushes, and the exact mechanism of injury was unknown in 34 cases, although mechanically propelled vehicles were concerned in most of them. Under the heading of "Fracture of the Pelvis" are included injuries ranging from slight to severe, some so severe that recovery is only just possible. There-

fore any statistics as to prognosis are valueless unless they are classified. The gravity of a case depends largely upon the presence or absence of injury to important structures inside the pelvic cavity. Chief among these are rupture of the bladder and urethra (20 per cent. of cases). Injury to the kidneys, although included in these statistics, hardly seems attributable to pelvic fracture. Of 15 cases of rupture of the bladder eight recovered. Early operation and perineal drainage in this injury as well as in ruptured urethra is of the greatest importance as a preventive of sepsis, which is the most frequent cause of death, apart from concomitant injuries. Diagnosis of bladder rupture by the injection of sterile air and subsequent X ray photograph is strongly recommended. A tied-in catheter does not prevent the occurrence of sepsis and seems to increase the liability to stricture in cases of ruptured urethra.

The general mortality amounted to 12 per cent. of all the cases here recorded. Double vertical fracture of the pelvic ring was the most fatal (30 per cent.), while fracture of the expanded portion of the ilium was least deadly, having a mortality of only 3 per cent. 114 pages of the work are taken up by small print records of case-histories, illustrated with outlines of X ray pictures. There is a copious bibliography and 16 plates of excellent reduced reproductions of X ray photographs. There is, unfortunately, no index.

This is a very painstaking and conscientious study of the subject.

SYPHILIS.

Second edition. By HENRY H. HAZEN, A.M., M.D., Professor of Dermatology and Syphilology, Georgetown University and Howard University. London: Henry Kimpton. 1928. Pp. 643. 42*s*.

THE progress in syphilology since the first edition of this work appeared in 1919 has necessitated a thorough revision, which has been achieved with practically no alteration in size. The earlier chapters contain useful statistics of syphilis in various sections of the American population, as well as a valuable discussion on infection and immunity. Excellent accounts are given of the early stages of the disease. The cutaneous manifestations, which are classified according to the system of the American Dermatological Association, are particularly well described and illustrated; a valuable feature is the note of the histological changes in each type of lesion. The late lesions are dealt with systematically. The chapters on the vascular system and the genito-urinary tract are of a high standard and excellent coloured plates of the cystoscopic appearance of vesical lesions are included. Not many surgeons will support the author's opinion that syphilitic bone disease is a very frequent cause of spontaneous fractures, nor that the clavicle is the favourite bone for syphilitic involvement; this last statement is, moreover, at variance with the statistics given in the earlier part of this chapter. Radiographic evidence of a syphilitic lesion has frequently been noted in Charcot's joints; Dr. Hazen believes that most manifestations of this condition, especially those of the hypertrophic type, are due to the direct action of the spirochæte rather than of neuropathic origin. He devotes considerable space to involvement of the central nervous system, drawing special attention to the high proportion of cases of early syphilis in which this system is affected, and to the necessity of examination of the cerebro-spinal fluid. The various types of neurosyphilis in all stages are lucidly described and full details are given of the technique and value of the Lange gold chloride test. Tryparsamide does not meet with his unequivocal approval, but Dr. Hazen is very favourably impressed by the results of intraspinal treatment after the technique of Swift and Ellis, which is fully discussed. The treatment of general paralysis by malarial therapy is dismissed in a very cursory manner.

Readers who appreciate the full details of treatment for the various stages of the disease given in most modern works of British origin will be disappointed with the chapter on treatment. The sections on the antenatal treatment of infected women, and the treatment of congenital syphilis in infants are certainly not full enough. As to the general principles of treatment, there are evidently differences in practice between England and America. The therapeutic value of bismuth appears to us to be underrated in this book, the author's experience of a high percentage of albuminuria following the administration of this remedy being unusual. Of the organic arsenical compounds, arsphenamine is recommended as giving good results in routine practice; toxic effects with both neo-arsphenamine and sulfarsphenamine appear to be more frequent than with similar preparations of European origin. The simultaneous administration of arsenical compounds and metallic remedies is not recommended.

Throughout the book Dr. Hazen quotes freely from authoritative sources, and gives extensive lists of references at the end of each chapter; he would have done well also to make clear his own opinion, based on personal experience, especially where controversial questions are involved. Students and practitioners will miss this guidance, but will appreciate the impartiality which characterises what is on the whole an excellent work.

DEAFNESS AND ITS ALLEVIATION.

By VINCENT NESFIELD, F.R.C.S., Major I.M.S. (ret.); Ophthalmic Surgeon, Queen's Hospital for Children. London: H. K. Lewis and Co., Ltd. 1928. Pp. 85. 7*s*. 6*d*.

UNDER this title Mr. Nesfield sets out to describe an operation he has designed for the relief of deafness. This consists in gouging away the bone to make a channel 14 mm. in diameter parallel to, and behind, the external auditory canal. The aim in view is to produce an aperture into the middle ear about 5 mm. in diameter. According to the author's description, this "boring" leads into the attic of the middle ear; the mastoid antrum is usually "non-existent, or only present as a thin red line of mucous membrane." The bridge between the "boring" and the external auditory canal is cut away to a depth of about 10 mm., and the external meatus split to make a flap, which is stitched to the under surface of the skin incision. Two tubes, 5 mm. in diameter, are inserted from the meatus backwards into the canal made in the mastoid; these are removed on the next day, and firm plugging inserted and renewed daily for three weeks with the object of keeping the opening patent. Nevertheless, the skin opening nearly always closes over at the back of the external auditory meatus; in time a very thin membrane forms in this situation. Mr. Nesfield claims that the operation improves the hearing in six different ways: (1) by rendering the Eustachian tube patent; (2) by allowing air to enter the middle ear directly through the new opening, "and this appears to be the most potent factor"; (3) sound waves impinge on the membrane which forms over the new opening; (4) the channel not only aerates the middle ear but drains it of mucus; (5) the boring and the increased vascularity resulting in the healing process produce a reflex effect on the cochlea; and (6) the increase of the total space of the middle ear increases the resonance. As to (1) he does not attempt to explain how or why this effect is attained. The benefit claimed in (2) cannot occur when the opening closes over as, on his own showing, it nearly always does; this criticism applies also to (4), while (5) is a highly speculative statement.

The book appeals rather to the general public than to the medical profession; thus, of its 85 pages, but 14 are devoted to a description of the operation, its after-treatment, and its results, while the previous 56 pages contain a popular account of the anatomy and physiology of the ear, and of "the nature of deafness." The author says that, as it is not possible to gauge the result under three years, it is difficult to show exact results. It may be difficult, but it is

surely not impossible, to show the approximate results on all patients operated on three years and more ago. Such tables of the results of treatment have been compiled by other authors of novel methods, and the profession has a right to expect some attempt to show the result in all cases treated by one who makes large claims to alleviate such a disease as chronic deafness.

ACCIDENTS, AND PROBLEMS ARISING THEREFROM.

Lehrbuch der Unfallheilkunde. By Dr. PAUL JOTTKOWITZ, Oberregierangsmedizinabrat, Chief of the Orthopædic Installation, Berlin. Munich: J. F. Lehmann. 1928. Pp. 280 M.15.

THAT this book must cover a great deal of ground is evident when we reflect on the immense variety of injuries that result from accidents. No work quite like it has appeared in this country, where information has to be collected laboriously from text-books on medicine, surgery, orthopædics, and jurisprudence. In Germany, the pioneer country of workmen's insurance, quite a literature has grown up of which this volume is representative. The treatment of injuries is not considered in detail, but their disabling effects are discussed fully, and also the difficult subject of the estimation of wage-earning capacity after crippling injuries or loss of parts. In this last connexion, amputation sites and artificial limbs come under review. The extent of the field will be indicated by the quotation of some of the headings, which range from accident insurance, infected wounds, animal infections such as glanders, tuberculosis, diabetes, acromegaly, and arthritis, to artificial limbs. This work is in some sort an epitome of medicine and surgery from an industrial insurance point of view, the diseases of the special senses being excluded. It is of considerable medico-legal value, and certainly should be studied by medical officers concerned with the relations between patients and employers.

DISEASES OF THE BLOOD AND BLOOD-BUILDING ORGANS.

Clinical Pediatrics. Vol. XI. By WILLIAM PALMER LUCAS, M.D., Professor of Pediatrics and ALFRED H. WASHBURN, M.D., Instructor in Pediatrics, University of California Medical School. Supervising Editor, ROYAL STORRS HAYNES, M.D., Clinical Professor of Diseases of Children, College of Physicians amd Surgeons, New York. London and New York: D. Appleton and Co., Ltd. 1928. Pp. 233. 16*s*.

DISEASES of the blood and blood-forming system form a small but important division of the ills of children. In this substantial volume there is no padding, and an admirable feature is the inclusion of illustrative cases. These are all well chosen and are worthy of close study by those concerned with the diseases of children and adults alike. The peculiarities of the blood picture in children, both in health and disease, are well described; the sections on the diagnosis and treatment of the various conditions are satisfactory, but the pathological side might well have been further elaborated.

New Inventions.

APPARATUS FOR RECORDING HUMAN BLOOD PRESSURE.

HITHERTO it has been impossible to obtain continuous records of human blood pressure with simple apparatus. Erlanger[1] obtained short continuous records at intervals, but the only apparatus devised for taking continuous records is a complicated apparatus employing an electric valve invented by Kolls in 1920.[2] Moreover, this apparatus did not record rapid variations in blood pressure. Consequently, much important work in relation to variations in blood pressure in human subjects under different conditions either has had to be omitted or has been performed by difficult and unreliable means. The simple apparatus about to be described is a step towards remedying this lack. As will be seen, it is a combination of some well-known apparatus slightly modified, and the instrument is obviously an object for improvement. It consists of two sections.

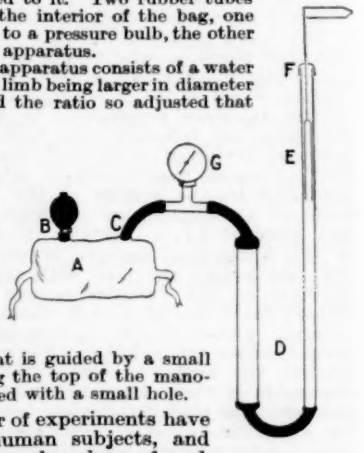
Continuous human blood-pressure record, showing the effect of respiratory cessation in the inspiratory position. Time intervals 5 secs.

[1] Erlanger, J.: Jour. Labor. and Clin. Med., 1926, xii., No. 2, 172.

[2] Kolls, A. C.: Jour. Pharmacol. and Exper. Therap., 1920, xv., 433.

1. An armlet made of a collapsible rubber bag (A), the outer surface of one side being made rigid by means of stiff canvas attached to it. Two rubber tubes communicate with the interior of the bag, one (B) being connected to a pressure bulb, the other (C) to the recording apparatus.

2. The recording apparatus consists of a water manometer (D), one limb being larger in diameter than the other, and the ratio so adjusted that one millimetre of mercury difference in actual blood pressure moves the liquid in the recording limb of the manometer an equal distance. To record on smoked paper, a special glass float (E), carrying a light celluloid pointer, is used. The stem of the float is guided by a small glass cap (F) fitting the top of the manometer and perforated with a small hole.



A large number of experiments have been done on human subjects, and the best procedure has been found to be as follows. The armlet is arranged immediately above the elbow, and the subject sits or lies with the arm supported in a comfortable position. The pressure in the bag is raised to 20–25 mm. Hg below the subject's systolic pressure. The requisite tension in the bag to produce this pressure can be ascertained by inserting a small meter (G) in a by-tube. In this way, 10-minute continuous records can be obtained without the subject experiencing any discomfort. It should be pointed out that the apparatus does not record systolic blood pressure but variations in blood pressure. By employing a simple factor the actual blood pressure can easily be ascertained if desired. The tension in the bag is, of course, considerably above the venous blood pressure and, consequently, volume effects are excluded. A typical tracing obtained with this apparatus is shown.

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THE LANCET.

LONDON: SATURDAY, AUGUST 11, 1928.

THE INTERNATIONAL UNIT OF X RAYS.

AT the First International Congress of Radiology, held in London three years ago, there was a discussion on the necessity of establishing an international unit to be used as the basis of all X ray measurement of dosage. It was felt at the time that satisfactory progress in treatment with X rays would not be possible without a unit which could be universally adopted. It was therefore resolved that an International X Ray Unit Committee be formed, and the British X Ray Unit Committee, which was established in 1923, was requested to communicate with the physical and radiological societies of the principal countries throughout the world with a view to the nomination of representatives to constitute such an international committee. During the last three years the British X Ray Unit Committee has had the matter in hand and a committee consisting of two representatives from each of 19 different countries has been formed. Each country was invited to submit the names of two representatives—one a medical man and one a physicist—to serve on this committee. To preserve a balance, the British Empire was represented by two members only.

The representatives were invited to submit their views on the X ray unit and the measurement of dosage, and it was at once evident from the replies received that the subject was one in which great interest was taken. A summary of the various points raised was prepared and submitted as a basis for discussion at a meeting of the International X Ray Unit Committee which met during the Second International Congress of Radiology held last week at Stockholm. Representatives from the following countries were present at the meeting: Belgium, Czecho-Slovakia, Denmark, Great Britain, France, Germany, Italy, Japan, Norway, the United States of America, Russia, Spain, Sweden, and Switzerland. It is gratifying to know that unanimous agreement was arrived at in the committee meeting concerning the main points under discussion. The following recommendations put forward by the International Committee were unanimously adopted at a general meeting of the Congress:—

1. That an international unit of X radiation be adopted.

2. That this international unit be the quantity of X radiation which, when the secondary electrons are fully utilised and the wall effect of the chamber is avoided, produces in 1 c.cm. of atmospheric air at 0° C. and 76 cm. Hg pressure such a degree of conductivity that one electrostatic unit of charge is measured at saturation current.

3. That the international unit of X radiation be called the "Rontgen," and that it be designated by the letter R.

4. That various standard methods be employed to establish the unit.

5. That for all comparative purposes it is advisable to employ ionisation chambers which have been calibrated in terms of a standard chamber for X radiation of the various qualities employed. It is also advisable to make the wall effect of these chambers as small as possible.

6. That the practical instrument used to measure X ray output be called a dosage meter.

7. That the constancy of the indications of the dosage meter be tested by means of gamma radiation emitted from a definite quantity of radium element, the measurement being carried out always under the same conditions.

8. That any specification of dosage is incomplete without specifying the quality as well as the quantity of the radiation. The quality of X radiation used for practical purposes is very varied and it would be impracticable to give a complete specification of it; but much information can be obtained from a knowledge of the degree of absorption of the radiation in standard materials, the peak voltage applied to the tube together with the filter employed, and the general character of the high tension apparatus. For practical purposes the quality may be expressed by stating the half value layer in a suitable material or by stating the effective wave-length as determined by the percentage amount of radiation transmitted through a given thickness of a suitable material (copper or aluminium).

In view of the fact that rapid progress is being made in methods of X ray measurement and in our knowledge of X ray phenomena, the Committee felt that the above recommendations should be regarded as provisional. They may be modified later in the light of further information. The adoption of the resolutions marks an important step in the measurement of X ray dosage. Not only will the confusion which has hitherto existed in radiology by the employment of the letter R to denote entirely different quantities be removed, but it will now be possible for a radiologist in one country to reproduce accurately an X ray dose and thus be enabled to compare his results with those of radiologists in other countries. Hitherto this has been impossible since there has been no international agreement concerning the unit in terms of which the dose should be measured. Emphasis has been laid on the need for specifying the quality as well as the quantity of radiation employed in treatment. The recommendations indicate how the quality may be specified, and it would be well in order to obtain as close agreement as possible if radiologists were to employ the methods suggested. The correlation of the physical dose and the biological dose needs careful consideration by the International Committee as it presents many difficulties. Whether these difficulties can be surmounted and a correlation be found is still an open question.

The International X Ray Unit Committee has been authorised to continue its deliberations and to submit a further report for consideration at the next Congress to be held in Paris in 1931. Prof. K. M. G. SIEGBAHN (Upsala) was elected chairman, and Prof. E. A. OWEN (Bangor) and Prof. HERMANN HOLTHUSEN (Hamburg) honorary joint secretaries of the International Committee during the ensuing three years. The British X Ray Unit Committee, which has had the financial support of the Medical Research Council, is to be heartily congratulated on the excellent work it has done during the last three years in preparing the way for the adoption of the resolutions by the Second International Congress of Radiology.

DISSOCIATED JAUNDICE.

SINCE the observations of certain French biochemists called attention to the fact that the elimination of bile-salts and of bile-pigments do not necessarily run a parallel course in certain cases of icterus, the study of so-called dissociated jaundice has been actively pursued by many observers. A recent article by CHABROL,

BÉNARD, and BARIÉTY[1] gives an account of the researches carried out by them during the last nine years on the excretion of bile-salts. The detection of bile-salts is fairly easy, but the quantitative estimation of these bodies either in urine, blood serum, or even in bile itself is a matter of great difficulty. Thus in blood serum these authors have found it impossible to obtain an estimate of the amount of bile-salts present by any method depending on diminution of surface tension. They have, however, been able to apply a modification of Pettenkofer's reaction which will give a positive result in dilutions as great as 1 in 10,000. In the case of urine, Pettenkofer's reaction has also been employed, but here surface-tension estimations have proved of value when carried out by a special technique. It has been found that the NaCl-content of the fluid is of importance, since the concentration of this salt may produce considerable modifications in the results obtained. When duodenal secretions, recovered by means of a duodenal tube, are examined, the estimation of the bile-salts is a simple matter as these bodies are always present in considerable concentration. The French observers have found that methods of estimating surface tension are the most readily applicable in this medium and give results of great utility, even if no claim to fine exactitude can be made. The principal conclusions drawn from their observations are as follows:—

(1) In normal circumstances, bile-salts can never be found except in the first part of the small intestine, the duodenal fluid giving figures in the neighbourhood of 15 g. per litre. The authors have given the name of biliary index to the ratio salts/pigments, and find that this index is normally in the region of 40. In the blood serum they are able to assert that if bile-salts are ever present in physiological conditions their concentration is certainly below 0·1 g. per litre, and as regards the urine they are again unable to find any evidence of the presence of these bodies normally.

(2) In the case of hæmolytic jaundice, the findings are comparable to those in the normal—i.e., bile-salts cannot be found in the blood serum and they do not lower the surface tension of urine. Duodenal tubage, on the other hand, gives a ready demonstration of the dissociation which is held to be present in jaundice due to excessive hæmolysis, the biliary index in such cases being as low as 6 instead of the normal 40.

(3) In obstructive jaundice bile-salts should theoretically be found with the greatest facility. Some 10–15 g. of bile-salts are normally excreted daily in the bile, and in cases of grave obstruction to the biliary passage it would be expected that a large part of this would appear in the urine, but such does not appear to be the case. In a series of 15 cases of grave obstructive jaundice, the authors have been surprised to find in the blood serum only the smallest trace of the bile-salts in spite of the presence of a high concentration of bile-pigments in the blood. In reality, the proportion of bile-salts was ten times less than that of pigments, whereas in normal bile these proportions are reversed. The first possible explanation of this fact is that the renal threshold for bile-salts is much lower than that for bilirubin. The study of the urine in such cases does not support this thesis, for whenever the concentration of bile-salts in the urine is measured, it is found that the amount eliminated in obstructive jaundice is relatively small, and there have often been cases of obstructive jaundice in which the pigmentation was of the deepest degree, and yet the urine showed an almost complete absence of bile-salts.

The conclusion is drawn that any icterus which goes on for a long time tends to be accompanied with a disassociation of the amount of bile constituents excreted, the pigments being the elements showing extreme retention. According to the theory of LEMIERRE and BRULÉ, such a condition, in which Hayes's reaction is negative, in spite of an intense choluria, indicates dysfunction of the hepatic cells, but following CHABROL, BÉNARD, and BARIÉTY, the true explanation would appear to be that there is a general deficiency of bile-salts in the organism in these cases, and they base this belief on the fact that the small quantities of bile which can be recovered by duodenal tubage in such circumstances demonstrate a considerable diminution in the relative content of bile-salts. To explain such a disappearance of bile-salts from the bile itself they have recourse to the fact that cholesterol is noticeably increased in the blood in all these circumstances, and they hold that it is possible that this increase of blood cholesterol is in part due to a failure of the liver to form bile-salts. Apart from this, the fact that the normal circulation of bile-salts from the liver to the intestine and then back by the portal vein to the liver has been interrupted by the presence of an obstruction, is thought to be sufficient to bring about a steady diminution in the bodily reserves of bile-salts.

In conclusion, these authors have attempted to discover whether there are not frequently variations in the excretion of bile-salts amongst patients suffering from diseases unaccompanied by jaundice. Here, again, caution must be observed because the surface tension of urine can be materially affected by many bodies in addition to bile-salts—chlorides, albumin, and polypeptides being outstanding examples. In many cases of secondary carcinoma of the liver, and during the course of certain acute infections, observations of the surface tension, together with a modified Pettenkofer's reaction, point to the possibility of an excessive excretion of bile-salts. These findings must, however, be accepted with reserve. Still more interesting are certain observations on the effect of injecting an excess of bile-salts into the blood, it being found that by intravenous injection a concentration much higher than that ever observed during biliary obstruction can be produced without any accompanying pruritus or bradycardia.

[1] Presse Méd., July 7th, p. 849.

ACTIONS AGAINST GOVERNMENT DEPARTMENTS.

GOVERNMENT departments are far from enjoying a good press at the moment. Judges abuse them in well-reported phrases; Prof. J. H. MORGAN has been attacking them in two articles in a popular evening newspaper; the Lord Chief Justice is understood to be devoting the Long Vacation to preparing for publication a book in criticism of bureaucracy. Though it is not unknown at public dinners for the civil service to hear itself praised for its competence, integrity, and self-effacement, there are plenty of cases (especially during war time) where Government departments have deserved the condemnation they have received. In one sense bureaucracy is increasing and must increase. The manifold activities of the Home Office and the Ministry of Health—in such directions as the inspection of factories, the notification of diseases, and the general supervision of health services—are in a measure an infringement of personal liberty. But it is too late to say that Government departments are not to interfere in these matters. On the other hand, the departmental attitude can easily exceed what is reasonable, especially in the absence of legal check. The medical profession may not be specially concerned, but it remembers its difficulties when panel doctors found the Minister of Health exercising not only executive but also judicial

functions and seeking to bar the avenue of appeal to the law courts. As a member of the public, too, the practitioner may be surprised at the results of the doctrine that the King can do no wrong. A doctor's motor-car may be smashed by a negligently driven Army lorry and the only remedy may be a futile claim against the corporal at the steering-wheel. Or, if a postman steals a registered and insured postal packet, it may turn out that the compensation is merely discretionary not contractual. It is not unimportant, therefore, to inquire the nature of the legal liability of State departments and to consider possible reforms.

Mr. J. W. GORDON, K.C., has recently published a pamphlet on "The Crown and the Courts" (Stevens, 1s.), setting out the case for reform illustrated by instances and judicial comments. His examples of the sins of Government departments are set out under several heads such as "usurpation of authority," "trespass to property," "imposition of unauthorised taxation," and "delay or denial of justice"—a damning list which suggests that the time has come for a fresh Magna Charta. The difficulty is at present that the Crown is immune from liability for the wrongful acts of its servants. Petition of Right will not lie for what the lawyers call a tort. There is some doubt whether this rule is historically well founded, but it is solidly established to-day and nothing but a new statute could upset it. In at least one of our self-governing Dominions the rule does not exist. Under an Act of 1903 the Commonwealth of Australia can be made responsible for the actions of its officers just as a master can be made liable for the actions of his servants. Australia has abolished the complicated and anachronistic procedure by way of Petition of Right and has put the subject when suing the Crown in no worse position than if he were suing another subject. Something of the kind is required in England. The obsolete procedure and the one-sided prerogative ought to be modernised and modified. After the war a strong committee was appointed by Lord BIRKENHEAD, when Lord Chancellor, to consider the position of the Crown as litigant and to prepare a Bill to amend the law as found desirable. After long delay, as Mr. GORDON says, a Bill was produced more than a year ago but nothing more has been heard of it. It may be urged that the matter is complicated and not free from controversy. The departments naturally fear a multitude of petty claims—for example, if the Admiralty carries out big gun firing near the coast and windows are broken. Nevertheless, it is understood that most of the Government departments are prepared to accept the Bill. Little will be done unless public opinion applies pressure. Mr. GORDON'S pamphlet is therefore timely, and those who wish to pursue the matter beyond the mere collecting of anthologies of judicial abuse of Government departments should study the draft Bill which was published as Cmd. 2842 in April, 1927.

AN International Conference on Light will be held at Lausanne and Leysin from Sept. 10th to 13th next. Those taking part will include Prof. H. C. Dorno (Davos), Prof. C. Fabry (Paris), Prof. V. Henri and Prof. Bloch (Zurich), Dr. Leonard Hill (London), Prof. Hausmann (Vienna), Dr. Alfred Hess (New York), Prof. Axel Reyn (Copenhagen), and Dr. A. Rollier (Leysin). Among the subjects to be discussed are the methods of measuring the energy and biological activity of light rays, irradiated foods and sterols, the climatic and light therapy of various forms of tuberculosis. Dr. G. Murray Levick is acting as general honorary secretary of the Conference in England, but all entrance fees and general inquiries should be addesssed to the Secrétariat-général de la Première Conférénce Internationale de la Lumière, Lausanne, Switzerland.

Annotations.

"Ne quid nimis."

THE DIAGNOSIS OF TUBERCLE IN GENERAL PRACTICE.

THE diagnosis of consumption presented no difficulty to the practitioner of 50 years ago. If cough, blood-spitting, wasting, night-sweats, and hectic flush proclaimed the disease the patient's friends were advised that he was in a state of consumptive decline, and the verdict was received as a sentence of death. The customary precautions were taken to postpone, as far as might be, the inevitable end. The dangers of fresh air were met by closed windows whose crevices were further sealed by crimson covered bolsters filled with sand. The bed was screened by heavy curtains, scarcely withdrawn to permit access to the sufferer. The patient's resistance was supported by drugs liberally prescribed, and blood-letting was resorted to in extremity. When the end came, both doctor and relatives had the satisfaction of knowing that everything possible had been done, and bowed themselves before the mysterious dispensations of Providence.

We know to-day that the symptoms and signs on which the doctors of a previous generation relied for diagnosis represent the last stages of disease and indicate as certainly as in the days of the younger Dumas the near approach of death. The importance of diagnosis at a much earlier stage as offering the only hope of cure has been emphasised by every teacher since the day when Koch made his great discovery. Indeed an almost morbid care has been exercised in the attempt to discover the earliest possible signs of tuberculosis. Great importance has been attached to almost imperceptible variations in breath sounds, and the skill of a piano-tuner demanded to determine relative changes in the percussion note of the lung apices. In recent years thousands of persons have been stigmatised as tuberculous and admitted to sanatoriums, where they have received treatment for non-existent disease, and been saved from a peril that never threatened. A more rational appreciation of the nature of tuberculosis, and in particular of the distinction between infection and disease, has led to a more reasonable attitude on the part of those specially interested in the care of the tuberculous. But the general practitioner, mindful of the teachings of his student days, and aware of some change in the modern attitude, remains in doubt as to the course he should pursue when confronted by a doubtful case. Any lack of acuity on his part may deprive his patient of the only chance of cure, while overscrupulous care may awake groundless fears and pave the way to chronic invalidity. A false step on his part may not only involve a period of needless inactivity for his patient, it may be responsible for either of those twin obsessions, the dread of the phthisophobic or the craving of the phthisophilic. The latter condition is perhaps more common than the former.

Dr. Lawrason Brown, of Saranac Lake, has endeavoured[1] to clear the air by setting up a diagnostic standard representing the minimal requirements for diagnosis. If he has erred it is on the side of boldness, but he has undoubtedly turned the hose of common sense on the sacrificial fires of the phthisical expert, and the practitioner whose hand may have lost some of its cunning and whose ears are slightly dulled by the passage of time will be grateful to him. His diagnostic criteria are: (1) hæmoptysis of a drachm or more; (2) pleurisy with effusion; (3) moderately coarse râles above the third rib and the third vertebral spine; (4) a parenchymatous Rontgen ray lesion in the same area; and (5) tubercle bacilli in the

[1] Jour. Amer. Med. Assoc., 1928, xc., 1032.

sputum. He claims that careful attention to these points will enable a correct diagnosis to be made in about 98 per cent. of all doubtful cases. Taking Dr. Brown's criteria seriatim—

(1) It will be noted that for significant hæmoptysis Dr. Brown postulates an amount of blood of not less than a teaspoonful. He thus excludes those cases of "coloured" or "streaky" spit which, except in cases of chronic fibroid phthisis, are usually due to causes other than tubercle. We might add that a hæmoptysis which the patient delights to describe is seldom tuberculous in origin, while one which he strives to minimise or attribute to epistaxis is almost invariably of sinister import.

(2) Pleurisy with effusion should obviously be treated as tuberculous unless some other cause is manifest, while dry pleurisy should at least be regarded as a danger signal.

(3) The significance of râles is usually appreciated, but the old and incorrect teaching that tubercle usually commences in the lung apex may lead to error. The signs of the graver types of phthisis, especially in the young, are usually found below the clavicle. The true apex of the lung is more often the site of abortive disease. A careful examination of the axillary regions may reveal crepitations when the upper half of the lung, both anteriorly and posteriorly, is apparently free. The necessity of auscultation over the lateral walls of the chest is too frequently forgotten.

(5) The importance of repeated examinations of the sputum for tubercle bacilli cannot be exaggerated. The failure to apply this simple test is responsible for more errors in diagnosis than all other causes put together. If five examinations at weekly intervals yield a negative result, the practitioner may regard the future of his patient with some degree of equanimity. There are exceptions to every rule, and all the circumstances of the case must be taken into account, but the records of any dispensary will show that, provided a conscientious search for tubercle bacilli has failed to discover the bacillus in the first instance, only in rare cases will a positive finding be forthcoming at a later date. Especially where young adults are concerned, experience does not support the statement frequently made that the "T.B. minus" case, failing sanatorium treatment, will later develop into a "T.B. plus" case.

(4) X rays are invaluable in the differential diagnosis of chest diseases, but a poor skiagram is worse than useless. Unless, therefore, a first-class apparatus and a skilled interpreter are available, the general practitioner will be compelled to rely on the symptoms, physical signs, and bacteriological tests. A history of exposure to infection obviously indicates the need for special care, but whenever possible a radiographic examination of the chest should be made, for, as Dr. Brown rightly insists, it is only in the absence of each of the five criteria that pulmonary tuberculosis can be excluded with confidence.

THE STYPTIC EFFECT OF TRANSFUSED BLOOD.

IT is generally agreed that blood transfusion is the most effective means of combating bleeding which occurs as a manifestation of the "hæmorrhagic diathesis." That this transfusion should have a beneficial effect by replacing lost blood is obvious, but it is far from clear why it should also stop the hæmorrhage, either for a time or permanently. The assumption has been that its hæmostatic effect is due to the introduction of thrombocytes or platelets into the circulation of the bleeder, but in considering this it has to be remembered that although most patients with manifestations of the hæmorrhagic diathesis show a thrombopenia, they do not all do so. Many a case has been reported in which bleeding ceased without any increase in the number of the platelets, and there are even records of hæmorrhage persisting despite the presence of platelets in fair numbers in the circulating blood. Evidence against the supposed hæmostatic activity of the transfused platelets is brought forward by Dr. Heinrich Engel,[1] of Prague, as a result of observations made in the course of treating four thrombopenic patients by blood transfusion. He found each time that within a few hours of transfusion the platelet count of the recipients had fallen to its original low level. In one case observations were made during and for 24 hours after the transfusion. In the course of the transfusion the blood was found to contain 28,110 platelets per c.mm.; within one hour they had fallen to 10,460; within six hours to 375, and 24 hours later to 80. Engel concludes that the beneficial results of blood transfusion in the hæmorrhagic diathesis are due primarily to the replacement of blood, which gives the patient a chance to tide over the thrombocytopenic period; he further believes that the transfused blood exercises a styptic effect which, although not due to the intact platelets it contains, may be partly traceable to their disintegration products. A part of the styptic effect, he suggests, may be in the nature of a protein shock reaction, due to the parenteral administration of a foreign protein, and in view of the well-known fact that the coagulability of the blood is increased after the induction of anaphylactic or anaphylactoid states this suggestion appears reasonable. It is supported by the common observation that those transfusions followed by pyrexia and even a definite rigor are particularly effective in stopping hæmorrhage. Since such reactions occur most frequently after transfusion by the citrate method, this may perhaps be regarded as recommending the method when arrest of hæmorrhage is desired.

GALL-BLADDER DISEASE IN THE YOUNG.

Dr. A. H. Potter[2] maintains that contrary to the generally accepted opinion, infections of the gall-bladder occur most commonly in adults under middle age, and that they may be met with quite often in adolescents and young children. In support of his contention he states that statistics of about 25,000 cases of gall-bladder disease collected from the reports of well-known clinics and hospitals show that the average age of patients at the time of operation is 36 years for females and 39 years for males, the interval between the onset of symptoms and the time of operation varying from 3 hours to 39 years. As regards the incidence of gall-bladder disease in very young persons Dr. Potter has collected and tabulated 226 cases in children not above 15 years of age, beginning with Gibson's case, reported in 1722, and ending with August, 1927. Negroes appear to be far less frequently affected than members of the white race. It is noteworthy that while in many instances the symptoms in children were as typical as in adults, children are rather inclined to complain of abdominal pain when gall-bladder disease is present. Dr. Potter contends that the acute infectious diseases of childhood have not received the attention they deserve as factors in the evolution of gall-bladder affections. Whereas in the past typhoid fever was generally the preceding factor in gall-bladder disease, of late years there has been a great decline in the incidence of typhoid, and if this continues the disease will be practically eliminated. On the other hand, there has been a great increase in influenza which Dr. Potter thinks is taking the place of typhoid as a factor in gall-bladder disease. Acute infections of the gall-bladder and cystic duct are usually accompanied by hydrops, which may be transitory or permanent. As the inflammation subsides the cystic duct recovers its function, drainage of the gall-bladder takes place, and hydrops disappears. Four cases in Dr. Potter's own practice occurred in a boy, aged 11, who had had influenza the previous year; a boy, aged 6, who had had scarlet fever 18 months before; a girl, aged 15, who had had influenza in the previous year; and a girl, aged 4½, without any history of illness. This incidence of

[1] Med. Klin., 1928, xxvi., 888.
[2] Surg., Gynec., and Obstet., June, 1928, p. 795.

infectious disease seems hardly greater than might be expected in a random sample of the child population. All the cases made a good recovery without operation.

ETHYLENE IN THE OPERATING THEATRE.

ETHYLENE for general anæsthesia has not in this country received the welcome with which it apparently continues to be greeted in America, and in the most recent contributions to the subject[1] we find nothing to make our views more favourable towards its use. The writers, having claimed ethylene as "one of our best general anæsthetics"—which for short operations we may grant them as a correct description—proceed to discuss the explosibility of the gas. In saying that this should not be ignored, they find that ethylene "differs very little from ether in this respect," but later demonstrate how great the difference actually is by detailing the precautions that should be observed to avoid explosion during the use of ethylene. Although these precautions are described as "not burdensome," they appear to outweigh any of the advantages demonstrated for the use of ethylene. The system for avoiding danger "available at little expense and trouble" involves insulated copper wire running along the gas tubes, metallic paint for covering the rubber bags (which must each contain about a pint of water), and a moist cloth attached to the metal frame at the back of the apparatus. "Any potential set up by the gas escaping under high tension through the reducing valves or by friction in the rubber tubes is at once grounded before the mixing of the ethylene and oxygen." The outside of the rubber tube is coated with the metallic paint. Within the tube is a bare spiral copper wire soldered to metal at each end. "It has also seemed advisable to solder a connexion to the metallic spiral in the wall of the rubber tube." Before each operation water is run through the tube. The anæsthetist's feet rest on a moist cloth, or he sits on a stool attached to a moist cloth. A special system of grounding must be worked out based on the fact that cement and tile are good conductors, but wood, linoleum, and rubber-covered floors are poor conductors. After studying the precautions required for the safe administration of ethylene according to these authors, we are left in doubt whether the anæsthetist should be best qualified as a fireman, an architect, or an electrical engineer.

[1] Amer. Jour. Surg., June, 1928.

PUBLIC HEALTH CONGRESS AND EXHIBITION.

A CONGRESS will be held at the Royal Agricultural Hall, London, during the week Nov. 19th to 24th, under the auspices of the various British municipal associations interested in public health administration. The congress will be formally opened on the Monday with an address by the Minister of Health, and on the afternoon of the same day Sir George Newman will speak on the purpose of the public health services. On Tuesday morning Sir Walter Fletcher will deal with research in relation to public health, and in the afternoon Dr. C. H. Bond with local organisation for the prevention and treatment of mental disorders. Housing and milk-supply will occupy the attention of the congress on Wednesday, the introducers being Mr. E. D. Simon and Mr. Wilfred Buckley. Thursday will be given up to water-supply and sewage, the principal speakers being Prof. W. J. Wilson, of Belfast, Mr. J. H. Coste, chief chemist to the London County Council, and Mr. John Gardner, of the West Riding Rivers Board. On Friday morning the new medical officer of health for the city of London, Dr. W. M. Willoughby, will speak on food protection, to be followed in the afternoon by Mr. R. H. P. Orde on the construction and equipment of hospitals. The final day of the congress will be given up to the subject of town cleansing. Official delegates to the number of many hundreds have been appointed, and their expenses will be paid by their local sanitary authorities. In the congress hall an exhibition will be held throughout the week, conducted on lines similar to that of the Public Works, Roads and Transport exhibit organised for many years past by Messrs. May and Pattisson, of 13, Victoria-street, London, S.W. 1.

FOOT-AND-MOUTH DISEASE.

FOOT-AND-MOUTH disease is of special interest to the pathologist, as its virus readily passes the pores of a fine porcelain filter, and the susceptibility of the guinea-pig to its action makes the disease a favourable subject for experimental research. The report[1] which has just appeared deals almost exclusively with the disease in small laboratory animals. Improved accommodation for large farm animals has, however, now been completed, and the experimental results obtained with guinea-pigs can be further tested on cattle, sheep, and pigs. The work on which the report is based (set out in three appendices) has been carried out at the Laboratory of the Ministry of Agriculture by Dr. F. C. Minett, at the Lister Institute by Dr. H. B. Maitland, Dr. T. Hare, Mrs. Y. M. Burbury, and Mrs. M. C. Maitland, and at the National Institute for Medical Research by Mr. J. A. Galloway and Dr. S. Nicolau. Mention is also made of research undertaken at the Lister Institute by Prof. A. Ciuca, of Bucharest. A fourth appendix contains a bibliography of work published since the last report appeared. An introduction contains brief reference to important recent work in other countries.

Lebailly and Vallée have noted the early appearance and rapid decline of infectivity in this disease in cattle, and the report contains evidence that active virus cannot as a rule be detected in the lesions of guinea-pigs beyond the third or fourth day after inoculation, though it was found by Dr. Hare in the apparently healthy skin of the ears as late as the tenth day. The results are similar to those obtained by Reppin who could not recover virus from the mouth in cattle later than the eleventh day after infection. Such observations contrast with the prolonged infectivity of the skin and mouth lesions and of the bone-marrow in the dead body, which have been shown to retain active virus for several weeks or even months if the animal has been killed during the infective period and the carcass kept at a low temperature. The viability of the virus on inanimate objects has been further investigated, and survival in vesicle fluid dried on glass and kept in a desiccator at 18° C. for at least two years is recorded. When dried on bran and kept under more natural conditions in the open air of the laboratory the virus has been found active after 40 weeks. Existing evidence therefore points to fomites rather than carriers as the reservoir of infection. Dr. Minett has tested the disinfectant action of a large number of substances, and finds that both acids and alkalis when highly diluted are very destructive to the pure virus; in the presence of organic matter they are much less effective. A 1 : 1000 solution of formalin sprayed on hay was capable of disinfecting it without making it unpalatable as fodder. Mrs. Burbury found that a temperature between 50° and 60° C. rendered inactive the virus contained in liquids, and that an orderly relation existed between temperature, time, and the concentration of the virus similar to that found in the case of bacterial emulsions. The duration and degree of immunity of the guinea-pig and the factors responsible have been examined, and a fairly close relation between the content of antibodies in the blood and the degree of resistance of the animal has been found to exist. It was recorded in an earlier report that a certain degree of active immunity resulted from inoculation with a vaccine consisting of virus killed with formalin. The effect of such a vaccine on the resistance of guinea-pigs has been studied, and confirmation of the previous results has been obtained.

[1] Ministry of Agriculture and Fisheries. Third Progress Report of the Foot-and-Mouth Disease Research Committee. Pp. 141. H.M. Stationery Office. 1928. 5s.

It has not, however, been possible yet to test the method on cattle in this country. Vallée, however, has reported encouraging prophylactic results in bovines with a formalised vaccine. The differences existing between the three types of virus found in Germany by Waldmann and Trautwein have been confirmed, but, with one exception, the type found in Great Britain has always belonged to the same type as Vallée's O strain. Three methods have been successfully used for determining the type of a virus :—

1. Inoculation of animals recovered from an attack due to virus of a known type.
2. Inoculation of animals protected by a formalised vaccine made with a known type.
3. Inoculation of animals passively immunised with serum of a known type.

Prof. Ciuca, using materials from guinea-pigs, has found complement fixation an effective method of demonstrating the presence of antibodies in the serum of recovered animals and of determining the type of virus present. Further experiments with rats and rabbits have confirmed previous observations showing the slight susceptibility of these animals, and have given no support to the suggestion that the disease is spread by rodents. Mr. Galloway and Dr. Nicolau give an illustrated account of the minute structure of the secondary vesicles on the tongue of guinea-pigs following inoculation of the virus into the sole of the foot. The work was needed because former studies had almost entirely been concerned with lesions at the site of inoculation or with vesicles in a comparatively late stage of the natural disease. The earliest pathological changes detected were small groups of three or four epithelial cells situated at varying depths between the stratum granulosum and the basal layer. The cytoplasm of these cells showed an altered staining reaction, and the nuclear chromatin was condensed into one or more deeply staining masses. At the same time, or very soon after, two or three polymorph leucocytes appeared close to the altered epithelium, but no cellular reaction in the corium could be detected at this early stage. The histological evidence thus brought forward favours the view held by Galloway and Nicolau that the multiplication of the virus is primarily in the epithelial cells. Mrs. Maitland has found that after inoculation of the sole of one hind foot the usual secondary vesicles could be prevented from appearing on the other foot by protecting the latter from pressure with a splint or a cotton-wool pad. On the other hand, if parts of the feet and toes not usually affected were subjected to increased pressure, vesicles appeared on these unwonted sites. Not only was the formation of vesicles controlled in this way, but experimental examination of the skin of the feet showed that the virus had not multiplied in the usual way at the sites of predilection on the soles when vesicles did not occur. The fact that the coöperation of the virus and pressure was needed to produce both the ordinary lesions of the generalised disease and free propagation of the virus in the usual sites is an interesting example of mutual action and reaction of an infective agent and the tissues.

The report shows steady progress in our knowledge of the infective agent, the pathology, and the nature and control of immunity in this important disease.

PROTECTION OF MOTHERHOOD IN SWITZERLAND.

EIGHTEEN years ago Dr. Bernheim Karrer stated in writing that there was nothing which could fairly be described as systematic protection of motherhood and infancy in Switzerland. A good deal of progress has been made in the meantime, and in a recent issue of the monthly bulletin of the International Office of Public Health Dr. Karrer, who is now director of the cantonal day nursery at Zürich, gives a critical survey of the work undertaken for the preservation of maternal and infant life. He still finds his country behindhand in the matter of antenatal supervision, stating that German-speaking Switzerland possesses no such thing as an antenatal clinic except for one or two connected with maternity hospitals. In French-speaking Switzerland antenatal clinics are distinct institutions, but there are very few of them compared with the number of child welfare consultations. Again, while laws are in force which make careful provision for the nursing mother, both in money grants and exemption from heavy work, the pregnant woman may ask to be excused from work in a factory for eight weeks before confinement only at her own expense, there being no financial help to enable her to do so. This poverty of antenatal care is the more unfortunate, since little improvement has been effected in the toll of stillbirths and deaths in the first four days of life during the last 15 years. Whereas the general infantile mortality stands at 56·5, comparing favourably with many other European countries, the mortality of the first four days is 19·2. In other respects, however, strides have been made; pædiatrics is now an obligatory subject in the medical course and examinations, and the study includes hygiene and feeding of infancy. Midwives, who are still the chief counsellors of Swiss mothers, have also had their training stiffened up and lengthened, and health visitors and baby nurses take a year's course followed by examination. Instruction of the public, and especially of mothers, is forwarded by schools for mothers, infant consultations (always conducted by doctors), and travelling exhibitions. The institutions for the care of babies include maternity hospitals, children's hospitals with wards for infants, refuges for mother and child together, baby shelters, day nurseries, and residential nurseries. The nursery at Zürich, of which Dr. Karrer has charge, is a home with 45 beds, attached to the obstetric clinic; it is primarily intended for premature infants, but also admits sick newly-born infants referred from the clinic. Many children are put out to nurse and, though nominally under medical supervision, in some districts the supervision is by no means satisfactory. In Zürich the work is carried out from a child protection office, and is so well done that Dr. Karrer suffers less anxiety on behalf of illegitimate infants who leave the nursery than of those whose parents are poor and improvident. A number of similar voluntary societies, as well as the national organisation "Pro Juventute," do useful work in backing up the State provisions.

ATMOSPHERIC POLLUTION.

THE thirteenth report of the Advisory Committee on Atmospheric Pollution[1] covers observations made in the year ended March 31st, 1927. It is the last of these reports to be issued from the Meteorological Office (Air Ministry), for the work has been transferred to the Department of Scientific and Industrial Research which will from now on coördinate local records and prepare an annual report thereon. This task will remain in the hands of Dr. J. S. Owens, who can be addressed at 47, Victoria-street, London, S.W. 1. In addition to this routine survey special researches are to be directed towards the solution of the scientific problems of atmospheric pollution, and these will come under the Director of Fuel Research, supervised by a committee of the Department, of which Dr. G. C. Simpson, F.R.S., is chairman, and Mr. J. K. Best (Cadbury Bros.), Mr. J. H. Coste (Chief Chemist, L.C.C.), Dr. G. M. B. Dobson, F.R.S. (Lecturer in Meteorology, Oxford University), Dr. R. Whytlaw-Gray (Professor of Chemistry, Leeds University), and Sir Napier Shaw are members. The last named has also expressed his willingness to serve as the first chairman of a standing conference of coöperating bodies which will continue the consultative work of the Advisory Committee. The report, as heretofore, contains a mass of information on the deposit of impurity at 80 different stations in the United Kingdom. Although the good stations continue to show improvement the bad ones remain as

[1] Department of Scientific and Industrial Research. The Investigation of Atmospheric Pollution. Thirteenth Report. H.M. Stationery Office. 1928. Pp. 54. 6s. 6d.

bad as ever. The highest deposit of tar as well as of sulphates was at Burnley; the lowest in either category at Southport (Hesketh Park). Newcastle-on-Tyne scored highest for carbonaceous or sooty matter which there may make up 40 per cent. or more of the total deposit, the lowest record being at Rothamsted. Some of the reduction in the deposit of sulphates seems to be due to the increasing use of gas as a fuel. In London and Glasgow from 1914 to 1927 the sulphate deposit has diminished out of proportion to the total. An interesting curve shows the effect of suspended smoky matter in the coal stoppage of 1926 at Stoke-on-Trent; in London the event produced no appreciable effect. It is also clearly brought out in a curve that nearly the whole of the ultra-violet rays of sunlight are cut off by a comparatively small amount of smoke in the air. An interesting account is given of a haze in Norfolk which was found to consist of salt crystals. While the continuance of these detailed observations under the ægis of the Research Department is assured, it must be no small satisfaction to those who have taken a share in this laborious survey for so many years that there will now be fitting opportunity for organised research into the scientific problems involved. The time is ripe for drawing conclusions from an immense wealth of material.

SYNTHALIN IN DIABETES.

THE use of insulin in diabetes has certain disadvantages. Although the necessity for injection encourages exact dosage, so far as quantity is concerned, it does not reproduce the conditions of physiological secretion, and where large doses are given the immediate result of its administration may be an excessive reduction of the blood-sugar, followed later by hyperglycæmia when absorption of carbohydrate from the intestine is well under weigh. From almost every point of view it would be preferable to use a drug which could be given by mouth and absorbed slowly with other contents of the alimentary canal, and high hopes were raised a couple of years ago when it was suggested that insulin might find a supplanter in the new German preparation called synthalin. This drug had not been invented ad hoc, but had been evolved during a series of investigations on parathyroid tetany in which it was found that guanidine caused a fall in blood-sugar. This happened only at the cost of poisoning the animal, but aminobutyleneguanidine proved less toxic, and synthalin—so far the most satisfactory of this series of substitution products—was recommended as relatively innocuous.

Synthalin contains two molecules of guanidine, joined by ten CH_2 groups, and its action is shown to be wholly different from that of insulin, as it lacks the essential power of promoting the oxidation of glucose. The first accounts of its effect on patients were nevertheless distinctly favourable. Frank, Nothmann, and Wagner[1] reported that sugar disappeared from the urine in mild cases of diabetes and that the blood-sugar was lowered, though not reduced to normal; in severe cases the dose of insulin could be reduced. They admitted that synthalin did not act quickly enough to benefit patients in coma, and they did not approve its use for children. The Medical Research Council arranged for tests in this country, and preliminary reports from many British hospitals were published in THE LANCET about a year ago.[2] These included investigations carried out at St. Bartholomew's by Dr. George Graham and Dr. G. C. Linden, who have now published a more detailed account of their work.[3] In 8 patients out of 12 they found that synthalin caused a very definite and apparently beneficial change in the carbohydrate metabolism. In one of the eight 50 mg. of the compound replaced 40–45 units of insulin without the blood-sugar exceeding the normal limit, but in the remaining four it afforded no practical benefit. These results are not so good as those of the early workers, but they are better than some of the others reported. The mode of action, as Graham and Linden point out, is still obscure. Insulin is a natural secretion, and will always lower the blood-sugar if enough is given; synthalin is a foreign chemical and has no action on sugar in vitro. They consider that synthalin must influence the carbohydrate metabolism by modifying cellular activity, and that this action is possibly a minor part of the more general effect that shows itself in toxic symptoms. It may work by depressing the power of the liver (increased in diabetes) to deaminise amino-acids, or its action may be regarded as a slight degree of a poisoning which when severe causes nausea, vomiting, pain, and jaundice. It is, of course, possible that its effect on carbohydrate metabolism is distinct from its toxic action, and that its failures are due to some idiosyncrasy in the patient. If this is so, it offers a parallel to salvarsan, which does not itself kill spirochætes, but causes the body to generate a lethal substance, and which also fails in some patients, whilst on occasion it produces effects comparable with those of synthalin. The toxic properties of synthalin are, however, a very severe drawback to its employment, for few patients who have experienced them will ever run the risk again. They occurred in 5 out of the 12 cases treated in this test. As prophylaxis against them, Frank has recommended that the dose of synthalin be withheld every fourth day, and A. Adler uses with each dose grs. 3 of sodium dehydrocholate ("decholin") which increases biliary secretion and may perhaps accelerate the excretion of synthalin from the liver.[4] This preparation was not tested at St. Bartholomew's Hospital, but Graham and Linden suggest that it should always be used, and that the dose should be carefully limited by starting with small amounts and gradually increasing them.

The fate of the sugar which disappears is unknown. It is not found in the liver or muscles as glycogen, and the lactic acid which is formed quickly vanishes again. Synthalin may merely destroy the sugar in the blood as yeast does in the stomach, but the appearance in one patient of a severe ketosis three days after the suspension of treatment suggests that the disappearing sugar was at least exerting an anti-ketogenic influence. To sum up, Graham and Linden say that there is no good evidence that the patients are really the better for having synthalin. Patients who need insulin had better use the natural product if possible; the new synthetic rival has a place only when there is a reason against injection.

[1] Klin. Woch., 1926, v., ii., 2100.
[2] THE LANCET, 1927, ii., 517.
[3] Quart. Jour. Med., July, 1928, p. 509.

HARVEST BUGS.

WE have in this country so few animals which bite and prick and sting with serious results that we make a good deal of fuss about beasts which are hardly worse than interesting. And now that the season of sitting about in the open air is with us, many people who respond vigorously to its attentions will lament the existence of the harvest bug or mite. They should also read the account of the animal and its allies which is given by Mr. Cecil Warburton in *Parasitology* (July, 1928, p. 228). There are about a dozen species of mites which afflict man in much the same way in different parts of the world; in all cases it is the larva alone which is parasitic and, as the adults are hardly known, the systematics of the subject are considerably muddled. The only one of which the life-history may fairly be said to be known is the Japanese *Trombicula akamushi*, which is something more than an annoyance because it transmits the river fever or tsutsugamushi disease. The larva in this instance is found abundantly on field mice and readily attacks dogs, cats, guinea-pigs, and other animals besides man. After much labour Miyajima succeeded in rearing adults and found that they were neither parasitic nor predaceous but can be reared on such food as potatoes and melons and appear

[4] Klin. Woch., 1927, vi., i., 493.

in nature to live on various plants; moisture is essential. Our national harvest bug is also a larva; none of the few people who have tried has succeeded in rearing the adult form, so that we have no means of knowing where and how it lives. More extraordinary still, perhaps, is the fact that those who study wild mites have failed to find one which may reasonably be supposed to be the missing parent. Obviously there is room here for an interesting piece of work. Dry grassy places, chalk downs, and the like, seem to be the animal's favourite habitat; it evidently lives somewhere, possibly underground or in the nests of mice. Meanwhile the best treatment for those who are particularly susceptible seems to be a complete change of clothes and a bath.

SCARLET FEVER ANTITOXIN.

WHEN this antitoxin was first introduced the important question was whether we had, or had not, found a useful agent in the treatment of scarlet fever. That question has been answered in the affirmative. Though no efficient serum appears to be yet available for combating the septic complications such as adenitis, otitis, or mastoiditis, there is now general agreement in many countries that for the treatment of uncomplicated attacks of scarlet fever caused by the toxin of the scarlet fever streptococcus, and for the protection of susceptible individuals who have been exposed to infection, antitoxin is potent and specific. Its use is now widespread. The main interest has therefore shifted to the question of dosage and standardisation. Of the methods of standardisation which have been tried, three need human subjects—viz., the Schultz-Charlton test, passive immunisation, and the Dick method of "skin neutralisation"; in two methods animals are used—viz., the Wadsworth-Kirkbride skin neutralisation in goats and the Parish-Okell rabbit test. If a test involving the use of animals has an error no greater than those needing human subjects, the animal test will presumably gain acceptance. The various methods are being compared in many laboratories but no critical comparison appears yet to have been published. Dr. R. Cruickshank elsewhere in this issue concludes in favour of the skin neutralisation method in human beings and the rabbit test, though his own careful observations on the duration of passive immunity show that this also is a good method of titration, for the effect of a dose of 2·5 c.cm. can be clearly differentiated from that produced by twice the dose, the patients in the latter group remaining negative to the Dick test for a longer period. This method would provide those in isolation hospitals with a means of testing the serum they use, for 5 c.cm. of a good serum will, as he [1] and D. McClean [2] have shown, keep the majority of patients negative to the Dick test for seven to ten days and will protect contacts from infection with scarlet fever. Parish and Okell [3] state that an average concentrated serum will in a dose of 0·25 to 1 c.cm. protect rabbits against the acute illness produced by the injection of culture of scarlet fever streptococcus. This method they use for measuring the strength of sera. Both Cruickshank and R. E. Dyer [4] discuss the difficulties of the skin neutralisation test. Not all Dick-positive subjects are suitable for the test, because of serum sensitiveness, and the readings are not easy. In U.S.A. an official unit based on this method has been fixed and a minimum content of antitoxin prescribed. No English official unit has yet been adopted. Meanwhile, the general experience in England that the sera available are efficient in the treatment of scarlet fever and for the passive protection of contacts is evidence that the methods of titration of these sera in use in the various serum institutes are serving their purpose and ensuring supplies of satisfactory sera.

[1] Glasgow Med. Jour., January, 1928.
[2] THE LANCET, 1927, i., 483.
[3] Jour. Path. and Bact., 1927, xxx., 521.
[4] U.S. Public Health Reports, 1928, xliii., 1659.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT CARDIFF.

(*Continued from p. 250.*)

SECTION OF SURGERY.

UNDER the presidency of Prof. A. W. SHEEN and later of Mr. A. J. WALTON, a discussion on the

DIAGNOSIS AND TREATMENT OF SPINAL CORD TUMOURS

was opened by Mr. DONALD ARMOUR, who limited himself to tumours arising from the cord, the spinal nerve roots, and the meninges, and chondromata of the intervertebral disc. Clinically they caused a paraplegia by compression. More than three-fourths were extramedullary and the intradural were more frequent than the extradural by three to one. Of intradural tumours about two-thirds were dorsal or dorsolateral in position. The course of the disease was usually slow and chronic and divided into three stages: (1) of root symptoms, usually unilateral; (2) of Brown-Séquard paralysis; (3) of complete compression, paraplegia, or bilateral paralysis. The symptoms generally appeared in the following order: Peripheral pain, increase of reflex activity below the point of compression, paralysis, loss of sensibility, and loss of reflex activity with flaccid paralysis. The commonest early symptom was localised, recurring and persistent pain, referred to the course of the nerve involved and attributed to innumerable conditions in the body and limbs. Pain in the back might be the only complaint for a long time, especially with lumbosacral and cauda equina growths. Pressure on the sensory tracts of the cord might cause pain in remote parts of the body before any motor or sensory changes could be discovered. Paræsthesiæ of various kinds might occur, at the level of the tumour, from root irritation; above the level, from pressure of the held-up cerebro-spinal fluid, or from sympathetic involvement; or below, from irritation of sensory tracts. Objective sensory changes were usually absent in the early stages and later depended on the amount of compression or destruction of the tracts. In extramedullary tumours there was some dissociation of sensations below the level of the tumour, while all types of sensation were equally involved in intramedullary growths, in which also the maximum sensory disturbance was often at and below the segmental level. Tactile sensation was less affected than pain and temperature. In tumours of the conus and cauda equina the sensory disturbance was usually bilateral and asymmetrical. Subjective motor disturbance usually followed subjective sensory symptoms and was progressive. In high tumours the order of limb involvement was almost always: homolateral upper limb, homolateral lower limb, contralateral lower limb, contralateral upper limb. The irritative stage, with tremor, muscular tension, and spasms was generally over by the time the patient came for examination, or was masked by a degenerative paralysis of the corresponding muscles with a diminished tendon reflex. When the tumour began to exert further pressure on the cord direct and indirect spinal symptoms appeared and were of great diagnostic value. Very often a minimal stimulus produced the "mass reflex." Bladder loss usually preceded rectal loss by some time. The pathological effects of the actual pressure on the cord were extraordinarily limited, as was shown by the recovery after removal of a large tumour. Paraplegia in flexion followed paraplegia in extension which might, however, be a very short stage.

Localising Symptoms.

Nystagmus might appear in high cervical tumours and bulbar symptoms occurred occasionally. Intense pain up the back of the neck and head might cause a clinical picture suggestive of caries or spasmodic torticollis. Involvement of the phrenic roots might cause diaphragm paralysis.

In lower cervical tumours four root syndromes might appear—Erb-Duchenne type; a middle type with atrophy of the triceps; Aran-Duchenne type and Dejerine-Klumpke type.

Lower dorsal tumours might simulate abdominal disease and lumbar tumours might show multiple root signs with atrophic paralysis. Tumours of the cauda equina caused intense pain radiating over the sacrum, perineum, and back of legs, and trophic sores were common.

Atypical clinical forms were of four kinds. Those with purely medullary symptoms showed paraplegia without any signs of root involvement. Those with purely root symptoms were like ordinary neuralgias. When there were multiple tumours, two root syndromes were superimposed. The vertebral form was marked by intense and diffuse pain and was often diagnosed as Pott's disease.

There was no symptom which occurred exclusively with any one kind of tumour. The symptoms differed in sequence, duration, and time of onset according to the localisation of the growth. A short history was in favour of the more rapidly growing extradural variety. Bony changes were rarely seen in intradural tumours and were common in extradural. Other features of extradural tumours were sensitiveness to pressure over the spine and absence of root pain and xanthochromia; lumbar puncture might cause sudden and marked increase in symptoms. Great excess of protein in the lumbar fluid combined with completely normal cisternal fluid or a "reversed" Brown-Séquard syndrome was in favour of an extradural growth. As a rule, intramedullary tumours were characterised by less frequent root pains, less spastic paraplegia, and more common amyotrophic phenomena, a more marked alteration in painful and thermal sensibility and a typical and clearly shown dissociated anæsthesia. In favour of a diagnosis of extramedullary tumour was: a preliminary stage of root pain, slow but continuous development of alteration in motor and sensory function, a growth in breadth rather than in length, fairly long persistence of a Brown-Séquard syndrome, marked spasticity persisting after the appearance of complete paraplegia with Babinski's sign; symptoms of motor root irritation and absence of signs of atrophic degenerative paralysis, and of trophic troubles, and the "loculation syndrome" in the cerebro-spinal fluid.

Combined cisternal and lumbar puncture was a diagnostic aid revealing below an area of compression, xanthochromia, increased protein and other substances, and occasionally spontaneous coagulation. The replacement of cerebro-spinal fluid by air caused no nausea, pain, or collapse in cases of spinal block. Lipiodol injection was not very reliable, and there might be sensory lipiodol dissociation; its greatest field of usefulness was where the sensory level was not well defined.

There was only one treatment—operation—which demanded correct diagnosis and precise level localisation. Segments of the cord did not correspond with the vertebræ of the same name, and there were also individual differences. The operation of choice was laminectomy as developed by Victor Horsley, with the patient in the lateral position, under intratracheal ether. (Mr. Armour then described the technique in detail.) French authorities were more enthusiastic than others in the use of X rays and radium for inoperable growths, but even they were cautious and warned against exaggerating the curative value.

Dr. G. RIDDOCH said that diagnosis must ultimately rest on the existence of a progressive paraplegia with signs pointing to root involvement. Remote signs might be absent at a stage when diagnosis was quite possible, or focal signs might be absent throughout. Clinical features came first in diagnostic significance, followed by investigation of the cerebro-spinal fluid and vertebral signs and, in selected cases, by other methods for determining the patency of the subarachnoid space. The paraplegia developed in a certain definite way; the first stage was a spastic paraplegia in extension, with a weakness that was more flexor than extensor, and which appeared more in the lower limbs, with downward pointing of the foot and toes. The reflexes were all increased and Babinski's sign was present. Homolateral extension of the whole limb might be evoked by stimulating the leg below the knee, and the gait was spastic. In the second and graver stage, of paraplegia in flexion, the flexion reflex dominated the reflex picture and could be obtained by stimulation of any part of the limb, and the mass reflex might be evoked. In the third stage there was flaccid paralysis. The diagnosis of the level of the growth was made primarily on focal signs, which might be of root or of segmental origin. The former pointed definitely to the segment involved, but the latter did not. Motor signs were usually of less value. Diagnosis was most difficult when there were no focal signs and reliance had to be placed on the often equivocal sensory phenomena and the motor and reflex signs, which were not much help. It was necessary to ascertain the point where normal sensibility changed into abnormal, and not merely the highest limit of complete anæsthesia; moreover, the obliquity of the fibres had to be taken into consideration. The appreciation of tuning-fork vibration was often valuable and might be impaired when the posterior columns were involved. On the whole, intramedullary tumours were more often cervical or lumbosacral in location and extramedullary ones about the regions of the enlargements. With the former, remote and focal signs appeared more or less together, while with extramedullary growths the focal signs might appear long before there was any paraplegia.

Lipiodol Injections.

Sir PERCY SARGENT showed lantern slides of different varieties of tumour and X rays of lipiodol injections. Lipiodol, he said, sometimes caused severe root pain and might have serious after-results. When successful it was very useful, but the better the neurologist the less often would it be necessary and it should be used less rather than more. Intramedullary tumours usually extended over many segments, producing an elongated block, in contrast with the local block of extramedullary growths. By a cisternal injection and a lumbar injection with the patient inverted, it was possible to map out an area of block. The prognosis of patients with intramedullary tumours was not hopeless—he had seen three recoveries. The operative mortality-rate was very low; the worst areas were between the second and fifth dorsal, where serious cardiac, gastric, or intestinal disturbance might be caused. The excellent recovery depended on the facts that compression had been very slow, that the bladder function was usually involved very late and very slightly, and that bedsores were very rare; there were therefore no septic complications.

Mr. LAMBERT ROGERS recorded six cases of spinal tumour from the Welsh National School of Medicine, one in a girl of 16, who had made a remarkable recovery. The tumour had contained many psammoma bodies and also masses of true bone, a very rare finding which afforded evidence of the essential similarity of cranial and spinal meningiomas and supported the mesoblastic derivation of membranes.

Mr. G. JEFFERSON said that his experience of spinal cord tumours was that they were practically painless and patients complained of spastic paraplegia. The syndrome of cord compression followed in a definite sequence, first a disturbance of motor power in the legs and then sensory changes of a particular kind, notably dissociation. He then showed a number of charts demonstrating the results of investigating the cerebro-spinal fluid by the Queckenstedt method.

The Importance of Early Diagnosis.

Mr. WILFRED TROTTER spoke for the common man, and said that the diagnosis was often missed in the early stages, especially when the disease began as

unexplained pain, which was almost always diagnosed by some meaningless phrase, varying from year to year with the fashion—neuritis, sciatica, arthritis, fibrosis. That was the form in which spinal tumour came before the panel doctor. The commonest tumour was the neurofibroma, and this essentially began with root pain, without any physical signs. If it were then diagnosed, treatment would be early and almost invariably successful.

Mr. H. ADAMS quoted a case of psammoma of the sixth dorsal region, which began as a painless limp. He suggested that the neurofibroma type might be the cause of pain, while the psammoma and endothelial type of tumour was the cause of spastic paraplegia.

Mr. STANLEY FOSTER recorded several cases with no paraplegia, only pain; one had been diagnosed as neurasthenia, and another as Pott's disease and disseminated sclerosis successively.

Mr. R. BROCKMAN said that cases of unexplained pain were the most difficult to diagnose, and instanced one woman with unilateral pain radiating from the lumbar region round to the pelvis. She had had an inflammatory mass removed from her abdomen and a subsequent nephrectomy without relief, and died suddenly after a profuse hæmorrhage from a spinal tumour. Cases of "curious pain" should always suggest spinal cord tumour.

Mr. WALTON said that the slower the course the better the prognosis, as the ultimate results depended less on the presence of a tumour than on the damage it had done, which was proportional to the rapidity of its growth. All cases should be operated upon at once. He agreed with Mr. Armour's technique. What operative risks there were were the accidental risks of all operations.

TREATMENT OF GANGRENE.

Mr. SAMPSON HANDLEY (London), in opening the discussion, said he proposed to confine his remarks to more recent methods of vasomotor surgery in relation to gangrene, and gave a brief history of the subject. He described Leriche's method of performing periarterial sympathectomy and stated that this surgeon had had successes in various conditions, but he did not perform his operation for gangrene. According to Prof. Leriche, after sympathectomy there is a local contraction of the artery, and for some hours pulsation is feeble and the limb is colder than its fellow. This is followed by elevation of the temperature of the limb and of the arterial pressure, and by increased amplitude of the pulse for from three to four weeks.

The speaker then drew attention to his method of alcohol injection, which he believed was a definite advance on Leriche's operation, and claimed that in certain cases it will avert threatened gangrene, or arrest the spread of senile gangrene already present, and so obviate amputation. The technique used is to expose the femoral artery in Hunter's canal for 1 to 2 in. With the finest possible hypodermic needle 2 to 3 minims of alcohol are injected at four points spaced round the artery, the needle being inserted obliquely and nearly parallel to the vessel. When the injection is complete a whitish band about ½ in. wide should be seen round the artery, but no constriction takes place. The effect of alcohol injection is that the foot in successful cases becomes warmer almost at once and the vasodilatation may last for a year or more, whereas it is stated to pass off in a few weeks after Leriche's operation. Mr. Handley mentioned some criticisms of the method and stressed the difficulty of making a proper selection of cases at present. In regard to indications, he would advise it strongly in cases of threatened or incipient gangrene of a lower limb, but would prefer to employ it in the prodromal stage. He considered it useless in Buerger's disease and of doubtful value in Raynaud's disease. Finally, he claimed that alcohol injection was a distinct advance on Leriche's operation, and appealed to medical men when first consulted for symptoms of arterial dystrophy to allow vasomotor surgery a fair field in its attempts to avert the onset of gangrene and the loss of a limb.

Mr. PHILIP TURNER (London) said he would confine himself to the clinical aspects of periarterial sympathectomy, which he had performed eight times, twice by operation and six times by alcohol injection. Of these, three were very striking successes which he narrated, three were temporarily improved, and two, whose general condition was very bad, died. Mr. Turner pointed out that following sympathectomy the following clinical effects were seen whatever their cause—namely, increased warmth of the foot, relief of pain, disappearance of swelling, rapid formation of a line of demarcation, and improvement in general condition. Mr. Turner said this operation was a valuable addition to amputation, which might be avoided in 25 per cent. of cases and delayed in 50 per cent., and in his opinion it is particularly indicated in early cases of senile gangrene and should be carried out as soon as the diagnosis is made.

Mr. E. G. SLESINGER (London) could not agree that sympathectomy acted by dividing the vasoconstrictor fibres; all modern evidence, he said, was against this. He suggested that what were divided were the afferent sensory nerves of the arteries, and the effect of sympathectomy was due to breaking the reflex arc. He discussed arterial pain and compared the pain of angina pectoris and abdominis with that of incipient gangrene. In his experience the operation succeeded when there was reflex spasm in addition to organic narrowing. He could see no advantage in the method of alcohol injection over sympathectomy which he had performed 25 times with no mortality. Finally, he urged that sympathectomy should be tried in all painful cases of organic vascular disease, since it would relieve pain almost certainly and might, in addition, improve the circulation.

Mr. W. A. COCHRANE (Edinburgh) had treated cases of gangrene by exposing the main artery and rubbing it with gauze, and had had successes. He considered it of no value in endarteritis obliterans, but had found temporary benefit in varicose ulcers.

Sir WILLIAM WHEELER (Dublin) had no experience of alcohol injection. He related cases of thromboangiitis obliterans in which he had performed sympathectomy with no benefit and with no relief of pain, and he stressed the importance of removing the whole sheath.

Mr. R. STL. BROCKMAN (Sheffield) put in a strong plea for alcohol injection on the ground of simplicity which brought it within the compass of every surgeon. He considered it of value as a preliminary to amputation.

Mr. HANDLEY, in replying, mentioned the possible danger of absorption of toxic materials from the dead gangrenous part as the result of vasodilatation after operation.

FALLACIES OF X RAYS IN ABDOMINAL DIAGNOSIS.

At a discussion held jointly with the Section of Radiology, Mr. H. J. PATERSON (London) began by pointing out that medicine, being essentially an art, laboratory methods can never replace clinical observation. The chief fallacies as regards surgery might be grouped as: (1) those incidental to X rays; (2) those due to errors of technique; (3) those of misdirection; (4) those of interpretation. Under (1) the speaker said that X rays exaggerated stasis and a better method of estimating this was the charcoal method; a further fallacy under this head was spasm. Duodenal ulcers were seldom shown by X rays, but often inferred when not present, and whether gastric ulcers were shown depended on their size and depth. Under fallacies of technique were instanced the need for exposures in different positions, and the importance of having the stomach well filled with barium. Fallacies of misdirection consist of diverting the attention to some abnormality of less serious import than the main disease. The last group of fallacies of interpretation were numerous and cases were mentioned of error in connexion with

gall-stones, ureteric calculi, appendicitis, gastric ulcer, adhesions, &c. Mr. Paterson said an insidious fallacy was the claim that healing of a gastric ulcer could be shown by X rays. Ulcers are stated to heal in a few weeks after alkali treatment, but is the evidence good enough considering the intermittent nature of the disorder? Finally, the opener said he did not question the utility but the infallibility of X ray diagnosis.

Dr. F. HERNAMAN-JOHNSON (London) stressed the advantage of X rays over charcoal in localising stasis of the bowel. In regard to spasm he would hold that spasm persisting after full doses of belladonna shows some lesion in the alimentary tract. Failure to find organic lesions does not prove their non-existence, and a negative X ray can only exclude gross deformity. He objected to including fallacies of misdirection, as it is important to demonstrate any definite lesion. Fallacies of interpretation must always remain and no radiologist could differentiate on X ray evidence only between an inflammatory lump and carcinoma. It is important for radiologists to indicate which of their deductions depend on X ray findings and which on examination and history. The speaker pointed out the importance of not calling an appendix normal because X ray examination does not incriminate it, and stated that a pelvic cæcum which does not rise on a barium enema and which contains residue after 24 hours often means appendicitis.

Dr. A. F. HURST (London) said the diagnosis of gastric and duodenal ulcer depended largely on the skill of the radiologist and in experienced hands should be right in 90 per cent. of cases. He would never diagnose gastric or duodenal ulcer without X ray evidence and the same applied to carcinoma. In his opinion, if there was no obstruction, all gastric ulcers would heal if treated medically, provided treatment was sufficiently long and thorough, and their healing could be shown by X rays. Dr. Hurst mentioned the fallacy by which a not uncommon diverticulum in the region of the cardia is mistaken for ulcer.

Mr. W. MCADAM ECCLES (London) stressed the importance of a complete radiological examination, and mentioned cases where incomplete examination had led to unnecessary removal of the appendix.

Prof. A. FULLERTON (Belfast), after pointing out the necessity of piecing together the evidence of various investigators in order to make a diagnosis, discussed the value of stereoscopic X rays in differentiating phleboliths and calcareous glands from urinary calculi.

Sir WILLIAM WHEELER appealed to radiologists to follow-up operations performed on cases they had seen, and said it was important not to give too definite a negative report lest further observation of the case might be discouraged. Personally, he thought there was no such thing as medical treatment for chronic gastric ulcer.

Mr. RENDLE SHORT (Bristol) spoke of the value of coöperation between radiologist and surgeon and of the difficulty of proving a negative. In his experience, if the clinical diagnosis and the X ray diagnosis differed, the X ray diagnosis was more often the correct one.

Dr. T. I. CANDY (Newport) said that cases were often sent for barium meal examination too casually and without adequate notes. He asked that radiologists should be given proper data and that it should be remembered that they were often the only units of the team whose opinion was committed to paper and could be held against them.

The Chairman, Prof. A. W. SHEEN (Cardiff), spoke of the effectual coöperation that existed in his clinic, and said that negative X ray findings were often as important as positive ones.

Dr. O. LEWELLIN RHYS (Cardiff) likened the radiographer of some years ago to the race-course tipster who had to name the winner before the race, and was abused if he failed to do so. Nowadays, the surgeon must bear his share of responsibility for a preoperative diagnosis.

SECTION OF PATHOLOGY AND BACTERIOLOGY.

Sir THOMAS HOUSTON took the chair at a discussion on the

BACTERIAL FLORA OF THE INTESTINE IN HEALTH AND CHRONIC DISEASE

which was opened by Prof. J. CRUICKSHANK (Aberdeen), who surveyed the bacterial contents of the newly born and traced the changes that occur as age advances. He pointed out that the meconium is sterile, but organisms appear in small numbers in the first 24 hours after birth. During the first few days the organisms most frequently found are the *Staph. albus*, *Strept. fæcalis*, and members of the *B. coli* group. In the first sample of the meconium free fæces an organism of the *B. bifidus* type, appears. This latter organism increases in number and replaces other organisms to a large extent. If the child is breast fed, the *bifidus* type constitutes 95 per cent. of the organisms present. In artificially fed infants the predominant organisms are of coliform type. The fæces of breast-fed infants are distinctly acid in reaction, while those of artificially fed infants are alkaline or neutral. *B. bifidus* and organisms of the *acidophilus* type can survive exposure to highly acid fluids, which destroy coliform organisms. Thus the bacterial content of the intestine is related to the chemical reaction. Spore-bearing organisms are absent from the suckling's stool for the same reason. When breast-feeding is over opportunity is offered for the invasion of the alimentary canal by many organisms. The intestinal organisms have been grouped into two types, proteolytic and saccharolytic. Experimentally it has been found that a high carbohydrate diet gives a flora rich in *bifidus* and *acidophilus*, whereas a high protein diet gives a predominance of coliform organisms and spore bearers. Lactose appears to be the determining factor in the production of the saccharolytic type of flora. In 1915 Torrey reported favourably upon the use of lactose in typhoid fever, a most marked change occurring in the bacterial flora. The same treatment has been applied to conditions of intestinal origin in children associated with lassitude and anorexia with diarrhœa or constipation, in which there is proteolytic intestinal flora. A quicker transformation of the flora is achieved by combining lactose diets with cultures of *acidophilus* organisms. Prof. Cruickshank attributed the action of the sugar to its being attacked by *B. coli* and *B. welchii*, the various acid substances produced offering a suitable pabulum for the growth of *B. acidophilus*. This is suggested by the fact that direct inoculation of fæces into milk gives abundant growth of *B. coli* and enterococci in the first few days, but at a later date vigorous growth of *B. acidophilus* occurs. Sugars other than lactose have been tried but the above results have not been obtained. Starchy foods, however, tend to change the flora. The administration of animal proteins, on the other hand, produces a marked proteolytic or putrefactive flora. The speaker emphasised that to change the type of bacteria to the acid variety large quantities of lactose must be used, together with an *acidophilus* culture capable of surviving in the intestine. He further declared that the types of intestinal flora are most probably the result of abnormal intestinal conditions and not the cause of them. Dealing with the subject of auto-intoxication, he said that nothing had emerged from chemical or bacterial research in recent years to support the view that harmful substances are elaborated by bacteria in the intestine and then absorbed. It had been shown that a closed-off loop of intestine may contain very toxic material, but this is incapable of deleterious effects until the intestinal mucosa is grossly damaged. Experimentally produced intestinal obstruction in dogs tended to show that the resulting toxæmia is not so much due to bacterial disintegration above the obstruction as to mechanical disturbances below. In chronic ulceration there is frequently no evidence of intestinal toxæmia in many cases, although it might

be expected that absorption of toxic substances would take place at the site of damage of the mucosa. Many workers have held that intestinal mucus is an important defence against the invasion of organisms. Absence of vitamin A from the diet has been shown to produce changes in the mucous glands, and it is believed that these changes permit the entry of organisms normally held at bay. These views have been confirmed by further work in which animals have been fed on a diet deficient in vitamin A and subsequently found to be much less resistant to pathogenic organisms administered by the alimentary canal than other animals on a normal diet. It has been also shown that there is a relationship between the reaction of the intestinal contents and the occurrence of rickets, in this latter pathological condition the cæcal contents being alkaline while administration of cod-liver oil results in a change to an acid reaction. Deficiency in vitamin B is also associated with alkalinity of the cæcal contents. In considering the possible relationship of pernicious anæmia and intestinal toxæmia, it was pointed out that such relationship had not been proved. *B. welchii*, one of the organisms held responsible for the condition, is present in normal stools and no increase in pathogenicity or hæmolytic power has been found in pernicious anæmia. Further, bacterial toxins similar to that of *welchii* may be administered by the mouth without producing specific symptoms. Prof. Cruickshank strongly emphasised the importance of realising that an enormous variety of organisms can be cultured from normal fæces by various bacteriological methods, and he deplored the too often labelling of organisms as pathogenic with immediate recourse to the use of vaccines. Many of the organisms occurring in the intestine are ingested in the food and dust and are passively carried by the intestinal contents. Others find conditions suitable for multiplication. Before accepting an organism found in the stool as the causative agent even in acute intestinal disorders, much evidence other than its presence in considerable numbers, or that it shows pathogenic properties on injection into animals, must be presented. The organisms in the human intestine were compared with those occurring in the soil, the flora in each case being determined by the nature of the available food material. If the intestinal contents could be more frequently regarded as material which is outside of the tissues, and separated from these by a mucous membrane which is endowed with peculiarly selective absorptive powers, there would be less tendency to regard the bacterial flora of the intestine or its individual members as concerned in the causation of many chronic conditions in the human subject.

Discussion.

Sir THOMAS HORDER supported Prof. Cruickshank's contentions and said he was glad to receive academic support to his own beliefs on the subject. The standards at present used as criteria of pathogenicity of intestinal organisms are unsatisfactory. Further, there is no standard technique, with the result that clinicians are at a loss to understand the varying bacteriological reports on the same sample of material submitted to a variety of workers.

Prof. J. H. DIBLE (Cardiff) described a large series of investigations of intestinal organisms during the period of the war. In the first group of this series Morgan's No. 1 bacillus was extremely rare. There were no cases of dysentery in this group. In successive groups dysentery became a frequent occurrence and Morgan's No. 1 became proportionately more frequent. The criteria on which the diagnosis of hæmolytic streptococci is based was also carefully considered. Some methods show a large percentage of these organisms in the fæces in certain cases, but a more detailed and extended investigation throws doubt on the findings recorded. Prof. Dible also pointed out the extreme difficulty of determining the exact nature of a normal intestinal flora.

Dr. A. F. S. SLADDEN (Swansea) spoke from the point of view of a routine bacteriologist. He emphasised the need for clarity on this subject. Regarding technique, he believed that material from the mucosa rather than mixed fæces should be used in bacteriological investigations. Direct examination of stools for micro-organisms he considered of doubtful use. A new method of investigation is required, and such a method must be short to be of value to the clinical bacteriologist.

Dr. L. P. GARROD (London) had carried out a series of careful investigations in an attempt to establish what fraction of the intestinal bacteria in health and disease is composed of streptococci. He was able to show that a low carbohydrate diet was associated with a diminished number of streptococci. He was unable to show that the bile in the intestine had any effect on these organisms, neither did the chemical reaction influence the relative numbers. In cases of pernicious anæmia, colitis, and chronic arthritis no definite increase of streptococci could be found. Dr. Garrod believed that estimation of the numbers of streptococci as an indication of pathogenicity is misleading.

Dr. A. P. CAWADIAS (London) dealt with the clinical aspect. He classified intestinal infection into extra-infection and auto-infection. The auto-infections may be of saccharolytic or proteolytic type. He had obtained good results by the use of vaccines. He said further that cases of auto-intoxication occurred with no symptoms of intestinal disturbance. He considered the possibility of mild anaphylaxis being the cause of these latter conditions should be given every consideration.

The CHAIRMAN expressed the opinion that the percentage of streptococci found in the stools depends on the cultural method used. The discussion had shown that no useful conclusions could be drawn from a bacteriological examination of the stools with present technique. It would be, however, difficult to convince clinicians on this point. An important point in favour of absorption of organisms from the intestine is the presence of intestinal organisms in remote parts of the body. The speaker had investigated several cases in which the enterococcus was believed to be the organism causative of lesions in urinary tract and nose. An organism had been isolated from stools in cases of ulcerative colitis by Burger and by Houston. This organism, believed to be the cause of the associated lesion, is said by the speaker to be of enterococcus type. He had also obtained good results from vaccines in cases of believed intestinal auto-intoxication of enterococcus type.

Reply.

Prof. CRUICKSHANK, in reply, said it is necessary to show that organisms or their toxins are absorbed before good results said to be obtained by vaccines can be claimed to be due to antibodies. If chemical substances are absorbed the formation of antibodies to combat them is unlikely. He expressed doubt on the benefits claimed from vaccine treatment. The possibility of anaphylaxis as a resultant of disturbed intestinal conditions was worthy of consideration.

SECTION OF ORTHOPÆDICS.

UNDER the presidency of Sir JOHN LYNN-THOMAS a discussion on

LOW BACKACHE AND SCIATICA

was opened by Mr. W. A. COCHRANE, who said that careful eliminative diagnosis left a large group which was essentially orthopædic, and which included the industrial lame backs. A painstaking and meticulous routine examination was of the utmost importance. Special attention must be paid to the anatomical type of the individual. The slender, tall and lanky, or small and delicate patient was unfit for heavy work and subject to functional breakdown of the back. The second point for consideration was the impairment of the normal balancing mechanism by bad posture. The lumbo-sacral joints in particular

were overloaded in heavy people with prominent sagging abdomens, and the sacro-iliac joint was also exposed to static insult from flat-foot, short leg, or a hip affection. When X rays revealed no intrinsic lesion of the lumbo-sacro-iliac region the need for accurate diagnosis was acute. A negative X ray photograph did not warrant the assumption that there was nothing the matter with the patient, and careful reading of good stereoscopic radiograms often revealed a departure from normal in extrinsic lesions. In cases of alleged injury the symptoms were usually out of all proportion to the severity of the trauma. Compression fractures of the spine sometimes followed comparatively minor injuries, and were often overlooked. A lateral view often revealed a lesion that had been overlooked in the antero-posterior view. A complex and difficult problem was that of the relationship of anatomical variations of the fifth lumbar vertebra to backache and sciatica; was the association causal or casual? As Osgood said, the abnormality was to be regarded as potentially contributory, and there was an undoubted connexion between the presence of abnormality and the occurrence and persistence of symptoms.

The most difficult problem in cases of injury was the mental one. Malingerers, however, were not common. The workman was often genuinely deceived as to the true sequence of events, and, having little to show for his symptoms, was apt to exaggerate.

Differential diagnosis was always difficult, and definite intrinsic pathological lesions of bone and joint must first be eliminated. The chief points to be noted were the general build and attitude of the patient; the presence or absence of the normal lumbar curve, of listing or lateral deviation of the spine, of restricted and painful movements, of spasm or wasting of muscles, of swelling and points of tenderness, and the nerve function in the legs.

Clinical Classification.

Acute traumatic strain was a rupture of ligamentous and muscular fibres with all the phenomena of acute injury. A lesion in muscle caused pain when the muscle was thrown into action; a lesion of fibrous tissue when it was put upon the stretch; a lesion of bone or joint on all movements of the spine. The treatment was rest. A superadded infective focus might keep up the disability, as would also poor bodily mechanics and posture. While complete rest was advisable for a torn muscle or aponeurosis, a sprained joint should be made active as soon as possible.

General postural strain was a condition of general muscular fatigue and ligamentous strain. The patient complained of dull aching in the shoulders and low back, relieved by rest. There was usually poor posture and fatiguing occupation. Treatment was by rest, support, and postural re-education.

Lumbo-sacral strain showed itself by dull or acute pain indefinitely localised over the lower spine and hip, chiefly on one side, often accompanied by sciatica, and generally relieved by rest. Forward bending was limited by spasm of the hamstrings, and there was local tenderness on deep pressure and flexion of the hip with knee extended was limited. The treatment aimed at flattening the lumbar spine by rest, hot fomentations, and suitable exercises.

Sacro-iliac strain, in contrast to lumbo-sacral strain, usually affected the slender, visceroptotic type with poor posture. Sacro-iliac subluxation was rare, but sacro-iliac joint strain was common. There was referred pain along the first and second sacral nerves, and the tender spots were the inferior sacro-iliac ligament, the sacro-sciatic notch, and sometimes the trunk of the sciatic nerve. The diagnostic points had been well set out by M. N. Smith-Petersen.[1] The treatment was by rest and support, followed by heat, massage, and education to flatten the lumbar spine and undo the forward tilting of the pelvis. Mild cases were relieved by strapping, but usually a light brace and well-made corsets were required for a time. In more resistant cases the joint must be manipulated or ankylosed.

Combined pelvic joint strain.—Clinical features referable to both joints might be found together. An enlarged fifth lumbar transverse process causing pain usually responded to prolonged immobilisation, and support and operation was often successful. A better plan was to ankylose the lumbo-sacral region.

[1] Jour. Bone and Joint Surg., 1926, viii., 118.

The Pathogenesis of Idiopathic Sciatica.

A mass of reliable evidence was now available to prove that many cases of sciatica could be traced to an anatomical lesion or abnormality in the lumbo-sacral region of the spine. There was localised pain and tenderness on deep pressure, sciatic scoliosis and pain referred along the sciatic nerve, which was not usually tender. Painful semi-sacralisation of the fifth lumbar vertebra was now a well-recognised entity. Abnormalities of the facets were not unusual, and poor posture still further reduced the size of the small foramen, already filled with the large fifth lumbar nerve. Treatment was by prolonged recumbency and immobilisation of the spine, combined with hyperæmia.

Mr. P. J. VERRALL said that in the backache of pregnancy less and less could be ascribed to uterine misplacements, though intrapelvic trouble might lead to pain referred along the third sacral nerve, much more superficial than the pain of sacro-iliac strain. A large factor in the production of this pain was the chronically over-distended rectum. The commonest causes of backache were: (1) Chronic overstrain of the erector spinæ or abdominal muscles. The muscles tried to maintain tone and then gave way, causing low backache in the case of the erector spinæ and lordosis in the case of the abdominal muscles. (2) Fixed flexed hip, due to irritation of the psoas by a chronically inflamed appendix or overloaded sigmoid. In these cases there was always tenderness in one iliac fossa. (3) Subinvolution of the sacro-iliac joints. Relaxation of these joints occurred during pregnancy and the menstrual periods. A subsequent involution similar to that of the uterus should occur. If this failed, backache was the result.

The typical deep tenderness over the sacro-iliac joints was always found, and the other sacro-iliac tests were positive.

In sciatica following pregnancy the question of how much was due to toxæmia and how much to trauma had to be decided. There was no doubt that both fourth and fifth nerves might be injured, as in maternal obstetric paralysis.

Mr. D. MCCRAE AITKEN said that with the present school medical inspection two most fruitful sources of backache—round shoulder and hollow back—were fast disappearing. Crush injuries were much commoner in young children than was generally believed, as they occurred when the bones were still largely cartilaginous. The long back was ill-supported by the erector spinæ and the importance of the oblique and quadratus lumborum muscles was often overlooked. Much of the pain was probably due to quadratus lumborum. "Where you have tension, there you have pain." It was at the origin of the muscles from bone that the strain occurred, and when the muscles gave way the strain fell on the ligaments, causing swelling and pain. In treatment, consideration must be paid to the existence of a toxic element, especially large bowel absorption. In "ricked back" a strip of muscle often got kinked over a bony process producing an elongated swelling. Manipulation would release this strip and give a dramatic cure.

Mr. WHITCHURCH HOWELL agreed that the efficient treatment of round shoulders, hollow back, and scoliosis would go a long way in preventing backache. He discussed the diagnosis of backache, which should be grouped under the headings of: (1) lumbago, (2) anatomical abnormalities, (3) trauma, (4) sciatica.

The latter should be subdivided into true and false (due to pelvic lesions, arthritis of hip, &c.).

Mr. ROCYN JONES said that cases of backache might be divided into two groups—the traumatic and the postural (including the industrial lame backs). Both groups were complicated by infection. Difficulty in diagnosis arose between lumbo-sacral and sacro-iliac lesions. In lumbo-sacral lesions the pain was in the mid-line, there was rigidity of the lumbar spinæ, and the leg-raising test gave equal results on both sides. In sacro-iliac lesions the pain was below the posterior superior iliac spine, the lumbar spine was not rigid, and the leg-raising test caused earlier pain in the affected side. Stereoscopic X rays should always be taken. He stressed the difficulty in the differential diagnosis between sacro-iliac strain and early tuberculous disease. Until bony changes appeared in the latter differentiation was impossible. As regards treatment he agreed entirely with Mr. Cochrane.

Discussion.

Mr. ALAN TODD spoke of the causation of lordosis with backache in young men. Paralysis of the abdominal muscles due to muscular dystrophies, or anterior poliomyelitis and visceroptosis were the causes of several recent cases he had treated. Adequate supports by belts relieved these conditions, but in nonparalytic cases must be regarded as a temporary measure only. He emphasised the need for more orthopædically trained masseuses. This would only be obtained by making orthopædic surgery an essential part of medical training.

Dr. R. MANWARING-WHITE said that practitioners were to a large extent responsible for chronic backache, as the initial injury was often trivial and was then overlooked. The importance of toxæmias must not be underestimated.

Dr. W. A. MARRIS maintained that many cases were due to general ill-health. They were, in fact, "tired backs."

Dr. E. SOLLY complained that many patients were sent to him with a diagnosis of sciatica who were really suffering from an intrapelvic growth, frequently malignant, and not even in an early stage. These should be eliminated by careful rectal examination. Joint disease also often led to an error in diagnosis.

Mr. COCHRANE, in reply, said that he hoped to work on the lines indicated by Mr. Verrall—i.e., the relation of constipation, visceral tone, and other intra-abdominal lesions to backache. He pointed out the difference in the postural and kinetic use of muscles and the importance of physical training. He emphasised the importance of careful rectal examination of all cases.

VOLKMANN'S ISCHÆMIC CONTRACTURE.

Sir ROBERT JONES said that few cases were reported, because there was an idea that this condition conveyed some slur on the treatment; it ought, therefore, to be laid down most emphatically and intelligibly that ischæmic paralysis arose without any carelessness on the part of the practitioner. The essential pathological changes were degeneration of muscle and an increase of connective tissue in their substance, often with absence of sarcolemma nuclei. There was a round-celled infiltration and absence of transverse striation. The process was one of absorption and replacement of dead muscular tissue. The deformity was found mainly in children under 14 after injury to the elbow, and was due to pressure. About 80 per cent. of cases were associated with fracture. In a typical case the wrist-joint was palmar flexed, the carpometacarpal bones were dorsiflexed, the interphalangeals flexed, the hand pronated, and the elbow flexed. As a rule sensation and electric reactions were normal and the fingers could be straightened on flexing the wrist. The skin was blue, cold, and sometimes blistered and scarred. The muscles wasted rapidly and became hard and ropy; if the nerves were sufficiently involved conduction might be partially or wholly lost. Symptoms might appear a few hours after injury, and the damage was often completed in 48 hours. The contracture was preceded by numbness, swelling, muscular rigidity, and sometimes intense pain. If untreated the deformity increased, from contraction of the fibrous muscle and the disproportional growth of bone.

Mild Ischæmia.

Sometimes children were unable, months or years after elbow injuries, fully to flex their fingers. These cases suggested that a slight degree of ischæmia might be quite common, just as blue, swollen fingers might recover after the relief of pressure from splints. Brooks's experiments supported the contention that the hæmatoma within the antecubital fossa might produce venous block quite apart from bony displacement, splinting, or bandaging. Jepson had failed to produce anything but very temporary deformity by the application of splints, casts, and bandages to dogs. A persistent lesion had only been procured by application of an Esmarch bandage after incision and ligation of the femoral vein. If the wound were well drained the contracture could be prevented. The chief factor, therefore, in Volkmann's contracture was a direct pressure from within or without, causing acute obstruction to venous flow. Inflammatory products added to the pressure. J. J. Thomas had found nerve involvement in 60 per cent. of his series.

Prophylaxis.

Under no circumstances, therefore, should an elbow be tightly bandaged. The fracture should be reduced completely and at once. The backward displacement of the humerus must be corrected before putting the arm up in flexion; a sharp projecting upper fragment often added to the internal venous obstruction. Reduction was not easy if postponed for days. The arm should not be bandaged to the forearm nor the elbow to the side, but intelligent flexion was perfectly safe. If a surgeon could not reduce the fracture by manipulation he had better operate than leave it. All circular compression and splints should be avoided, especially if there were much swelling. All cases should be critically watched for the first few days. If great pain, stiffening, swelling, lividity of the fingers, or loss of voluntary movements appeared, the arm should be released from all compression and elevated. The methods of subcutaneous division on the antero-ulnar side of the forearm and of multiple incisions to evacuate the subfascial hæmatoma were worthy of further trial.

The prognosis was always grave, and worst of all when the nerve damage was excessive, when the obstruction to circulation remained pronounced, and when there was only mass movement in the fingers, and the wrist was fully flexed with the forearm fixed in extreme pronation. Treatment of the established condition was mechanical or operative, the aim being to keep the forearm supinated. The former line of treatment consisted in gradually extending first the fingers, then the metacarpophalangeal joints, then the wrist. Physiotherapy had an assured position and should include radiant heat, contrast bathing, oil stupes, gentle massage, and electrical stimulation of the muscles. When a nerve was divided operation was imperative, and the after-care was most important in cases of tenoplasty. Myotomy and tenotomy were not to be recommended. Free excision of the elbow-joint might be indicated when there was contraction of tendons and fixation of the forearm in pronation.

Practitioners must insist on an X ray photograph or a refusal of it in writing, and should warn the patient of the possible serious results of an elbow injury: Volkmann's contracture and myositis ossificans. Further, they should join a medical defence union, for the law might be invoked whatever they did.

Mr. W. ROWLEY BRISTOW pointed out that ischæmic paralysis meant death of muscles, therefore both faradic and galvanic reactions were lost; in the milder cases they would be normal. Nerve suture was worth while, even if the muscles were beyond

recovery, as it restored gross sensibility. He emphasised the fact that the position for setting up fractures of the elbow was not "full" or "acute" flexion, but partial flexion across the chest.

Why the Forearm Only?

Mr. D. McCRAE AITKEN remarked that Sir Robert Jones never under any circumstances "stretched" a case "on splints"; he was most careful not to put a limb up in any tension. Volkmann's contracture was one thing—primarily a congestion, a deposition of lymph, and an organisation of fibrous tissue throughout the muscle, producing strangulation; nerve injury was another thing which might occur at the same time and ought to be dealt with at once. He suggested that the reason why the forearm was particularly affected was that its muscles were extremely highly organised with quick and fine reflex adjustments to each other, and therefore highly vulnerable in their function. He quoted a case which suggested that something depended upon re-education of the coördinating movements, and so upon the development of muscles which might not otherwise be restored to function.

Mr. H. PLATT put forward an anatomical explanation of the susceptibility of the forearm muscles, which arose from a small origin, and swept up obliquely, enclosed in a very tight compartment with a roof of unyielding fascia. Between internal and external condylar groups the biceps tendon was interposed. In this "box" it was easy to get pressure obstructing the venous return along the venæ comites of the ulnar recurrent arteries. The median nerve, passing between the heads of pronator radii teres, inevitably get strangled as the fibrous tissue contracted. A great advantage of operation was that the nerve could be freed and the muscles stripped off the epicondyle, thus giving a very good start.

Mr. D. S. MIDDLETON recorded some investigations into Volkmann's myopathy, particularly as it affected the sternomastoid in congenital wryneck. Scar tissue only occurred as a result of muscular death when the venous drainage was obstructed so that the products of autolysis could not be removed by the usual channels. They thus formed an irritating foreign body which was dealt with by the usual process of revascularisation and scar formation. Three or four days after venous ligature all the muscles were invariably found cyanosed, swollen, and necrotic, but a few months later some of them would be found to have recovered. A striking thrombosis occurred in the venous tree and was organised. Probably the temporary interference with venous return produced by ligature was not enough to cause fibrosis, but was converted into a secondary permanent interference by thrombosis.

Anatomically there was little connexion between the deep and superficial venous systems of the forearms below the bend of the elbow, and the venæ comites of the ulnar arteries were much larger than those of the radial. At the bend of the elbow there was a venous plexus that could be covered with a sixpence, and pressure on this meant obstruction to the venous return from almost the whole forearm. The profunda vein entered over the firm fibrous arch connecting the radial with the humero-ulnar origin of the flexor sublimis digitorum. A hæmatoma would force the veins down on to this edge and produce obstruction. Drainage operations therefore seemed reasonable. Mr. Middleton mentioned that of José Jorges, of Buenos Aires, who freely divided all the aponeurotic sheaths in a zigzag fashion to allow expansion and free drainage. If thrombosis had started, however, operation could not be expected to give complete recovery. Mr. Middleton concluded that Volkmann's ischæmic contracture resulted from interference with the venous return by a hæmatoma in a definite, localised spot in the antecubital fossa. It depended therefore on causes associated with the initial injury, and methods of treatment—or the absence of treatment—played a minor part, if any, in its production. It was not yet possible to say which cases would develop this complication, and it was doubtful whether that knowledge would materially assist its prevention.

Discussion.

Mr. TODD said that in view of the gross injustice which had recently been done to a member of the profession it was the duty of everyone to record cases of ischæmic paralysis occurring in the absence of any kind of splinting, strapping, or bandaging. He described two such cases, one an extremely bad and hopeless one following a fracture which had lain loose on a pillow without treatment, and the other, less grave, following dislocation of the elbow which had been reduced and sent away in a sling. He pointed out that it was never necessary to use an anterior splint or occlusive plasters for any fracture of the forearm; adequate posterior splintage gave perfect reduction. The teaching that a pad under the anterior splint helped to separate the bones of the forearm was false and pernicious.

Mr. HOWELL recorded some personal experiences, and pointed out that Volkmann's contracture was not a common thing, but that every injury of the elbow-joint ought to be regarded as a potential ischæmic paralysis. The treatment was to incise the hæmatoma, and to follow in detail Sir Robert Jones's method, by which independent joints were splinted with independent splints by an orthopædic masseuse. It was not possible to get more than a ¾-inch gap at operation without risk to the arterial supply. He described a modification of the collar-and-cuff method which ensured supination from the start.

Mr. P. J. VERRALL did not agree that ¾ inch was the maximum gap; the muscles could be stripped right across the interosseous membrane without any injury to vessels or nerves, provided always that this operation was never regarded as anything but an adjunct to Sir Robert Jones's stretching method.

Mr. ROCYN JONES agreed that the condition might come on without any splinting, and that this fact was one of the most important things to bring home to the public. He was glad to hear stress laid on the value of drainage in cases where there was œdema.

Sir ROBERT JONES, in reply, agreed that "acute flexion" was quite the wrong term for the correct position of fractured elbows, and that force should never be used in stretching the fibrous tissue—it was a real coaxing.

EXHIBITION OF DRUGS, SURGICAL INSTRUMENTS, FOODS, AND APPLIANCES.

THE usual trade exhibition was opened in the Drill Hall, Cardiff, on July 24th. A brief notice of the more important exhibits is given below, and will be concluded in the next issue of THE LANCET.

DRUGS AND PHARMACEUTICAL PREPARATIONS.

1. *General Drug Exhibits.*

[46] Allen and Hanburys, Ltd. (Bethnal Green, E. 2), drew attention to the fact that their "Allenburys" infant foods now have added to them a proportion of synthetic vitamin D, ergosterol, so that they fully protect against rickets. Among the "Azoule" brand sterile hypodermic ampoules are sodium salicylate and urethane preparations for the treatment of varicose veins. Liver extract for pernicious anæmia is prepared in powder, tablets, and capsules. "Charkaolin" is a new preparation for fermentative intestinal infections, combining the absorbent properties of vegetable charcoal with the toxin-adsorbing qualities of "Osmo" kaolin. A new laxative is "Byno Chrismol" with a cold-water extract of senna pods. "Iodolysin" is a fibrolytic agent for rheumatoid arthritis and allied conditions.—[60] Bayer Products, Ltd. (19, St. Dunstan's-hill, E.C. 3), showed a series of their well-known preparations, such as "Adalin," "Luminal," and "Plasmo-

quine" for malaria, and drew special attention to "Compral," a rapid analgesic without hypnotic effect; "Phanodorm," an hypnotic for general practice without cumulative action; "Theominal," a combination of luminal and theobromine for arteriosclerotic conditions; "Hexeton," a water-soluble synthetic camphor preparation for intramuscular and intravenous use; "Novasurol," a water-soluble preparation containing 33·9 per cent. of mercury in a complex non-ionisable form; and "Vigantol," a biologically standardised preparation of irradiated ergosterol, put up in pellets, ovoids, and a 1 per cent. solution in oil, of which 25 drops equals 10 mg. of vitamin D.—[39] Boots Pure Drug Co., Ltd. (Station-street, Nottingham), presented a series of pharmaceutical and toilet preparations, including "Columbrin," "Stabilarsan," "Thiostab," and "Bismostab."—[81] W. Bredt (41, Great Tower-street, E.C. 3) exhibited the "Ysates," dialysates from fresh plants, notably "Digitalysate," "Valerian-Digitalysate," and "Viscysate," prepared from *Viscum album* for conditions of high blood pressure. "Thilocologne," the preparation of ethyl chloride with eau-de-cologne, is now obtainable with a drop nozzle instead of a jet.—[20] Crookes Collosols (22, Chenies-street, W.C. 1) showed all their well-known colloidal preparations, such as argentum, iodine and manganese, and some new ones, including "Collosol Metallic Bismuth," a 5 per cent. preparation of finely divided metal which is usually absorbed within 10 days of injection, and "Collosol Mercurochrome" in dry scale preparation and sterile solution, standardised to obtain a definite percentage both of mercury and bromine. "Collosol Lactomagnesia" contains approximately 10 per cent. of magnesium hydroxide, and acts as an adsorber, a mild laxative, and a neutraliser without the evolution of gas. This firm also make some agreeable semi-toilet preparations, including "Collosol Argentum" tooth-paste and "Collosol Zinc" vanishing-cream.—[58] The British Drug Houses, Ltd. (Graham-street, N. 1), displayed their "Æther Puriss"; "Chloroform Puriss"; a non-clogging powdered liver extract, and their vitamin products, "Radiostol," "Radiostoleum," and "Radio-Malt," as well as "Caprokol," their urinary antiseptic; "Caprokol Antiseptic Solution S.T. 37," and their "Ergotoxin Phosphate," as used by A. Bourne and R. Burn.—[43] Burroughs, Wellcome and Co. (Snow Hill Buildings, E.C. 1) gave a prominent position to "Ephedrine," for asthma, hay fever, and leprosy; to "Allipol," the sodium salts of the less irritating fatty acids of hydnocarpus oil, and to "Avenyl," for leprosy complicated with syphilis. They also showed "Wellcome" liver extract and a representative display of standard drugs, sera, vaccines, and tuberculins.—[59] Evans Sons, Lescher and Webb, Ltd. (50, Bartholomew-close, E.C. 1), showed the various pharmaceutical specialties of this firm and the "Medi-soaps" manufactured by Charles Midgley, Ltd., of Manchester. Careful selection, preparation, and standardisation go to the making of this firm's gland products, which now include "Thymus Co.," "Mammary Co.," "Thyrosex Co.," and "Sexatones." This firm claim that their "Hepatex" is the cheapest and most concentrated liver extract on the market, one drachm being equivalent to two ounces of fresh liver. Their "Infundibulin" is now supplied in a special narrow-necked ampoule which can be opened without a file.—[35] Fassett and Johnson, Ltd. (86, Clerkenwell-road, E.C. 1), added to the well-known Angier's Emulsion and "California Syrup of Figs" a display of "Bemax," the new vitamin B preparation made from the detoxicated embryo of cereals.—[47] Ferris and Co., Ltd. (Union-street, Bristol), showed a series of fine chemicals and pharmaceutical preparations, particularly those of Martindale's "New Pharmacopœia"; also glandular products, cheap sterile accouchement outfits, and surgical dressings, specially set up in cabinets of "Ever-ready Caddies."—[27] Genatosan, Ltd. (Loughborough, Leicestershire), are very familiar for their "Sanatogen," "Genasprin" and "Formamint," and were displaying, as well as detoxicated and ordinary vaccines, their local immunity products, including an anticoryza vaccine spray.—[24] The Hoffmann-La Roche Chemical Works, Ltd. (51, Bowes-road, N. 13), draw special attention to their "Allonal" non-habit-forming hypnotic and analgesic, and "Isacen" non-toxic synthetic aperient, which gradually liberates di-hydroxyphenyl-isatin under the influence of the alkaline secretions of the intestine. "Somnifaine" is a liquid hypnotic of the barbituric group which can be administered orally, intramuscularly, or intravenously.—[10] J. F. Macfarlan and Co. (109, Abbey-hill, Edinburgh, and 32, Bethnal Green-road, E.1) showed a series of pure pharmaceutical chemicals, including alkaloids and capsules of amyl nitrite; anæsthetics, especially ethyl chloride, and dressings and ligatures.—[28] Oppenheimer, Son and Co., Ltd. (179, Queen Victoria-street, E.C. 4), stressed their new vitaminised preparations, such as "Vitad," a concentrate of the unsaponifiable fraction of cod-liver oil, 100 times stronger than the natural oil. This is supplied in "Palatinoids," equivalent to one teaspoonful and one tablespoonful respectively of the fresh oil. The little capsules make a most convenient vehicle of administration for young children. Irradiated ergosterol is also put up in "Palatinoid" form, and "Malt and Vitad" is a preparation equivalent to a 25 per cent. cod-liver oil and malt, but free from the unpleasant oily fraction. "Vitad" is also put into the well-known reconstructive food, "Roboleine."—[41] Parke, Davis and Co. (50-54, Beak-street, W. 1) demonstrated their recognised remedies, including quinine hydrochloride and urethane solution for sclerosing varicose veins, and also many recent introductions, such as "Adrephine," an aqueous solution for local use, combining the rapid relief of adrenalin with the sustained action of ephedrine; "Metatone," a tonic elixir containing vitamin B, nucleinic acid, and glycerophosphates; and "Paroidin," a standardised extract of bovine parathyroid glands for injection. "Oxytocin" is the pituitary substance that acts on involuntary muscle, and "Vasopressin" is the pituitary pressor principle. These two preparations will soon be on the market. Puerperal septicæmia streptococcus antitoxin is available for prophylaxis and therapeusis, while the series of "Immunogens," originating in the P., D. and Co. Laboratory, is now a long one.—[50] The Sandoz Chemical Works (5, Wigmore-street, W. 1) had on view their well-known products "Femergin," "Felamine" and "Bellafoline." "Allisatin" is their tasteless preparation of garlic. "Calcium-Sandoz" is obtained from an oxidation product of glucose by a special process and contains 13 per cent. of lime. "Sandoptal" (isobutyl-allyl-barbituric acid) is a new safe hypnotic, well tolerated by the aged.—[62] Schering-Kahlbaum, Ltd. (3, Lloyd's-avenue, E.C. 3), emphasised the value and safety of their non-narcotic analgesic "Veramon," and introduced "Solganal," a new gold product of low toxicity, particularly useful in leprosy, a 15-g. dose of which can be given with safety. Two other new products are "Vasano," camphoric acid salts of mandragora alkaloids, for train, air, and sea sickness, and "Synthalin B," a much less toxic product than the old Synthalin. "Atophan Balsam" is an amyl ester of "Atophan" for inunction.—[54] W. A. Wharram, Ltd. (34, Lady-lane, Leeds), make several popular pepsin preparations, such as "Liq. bismuth co. c. pepsin," and very many other therapeutic products. Mention may be made of ephedrine tablets for oral administration; "Linctus heroin hydrochlor. c. turpin. hyd."; "Syr. pulmonaria Co.," containing codeine phosphate, guaiacol, and calcium phosphate; "Ung. analgesic," a combination of methyl salicylate, menthol, eucalyptol and camphor; and "Ung. stimulans," a mustard preparation useful for rheumatic and neuralgic conditions.

2. *Special Drug Exhibits.*

[22] Anglo-American Oil Co., Ltd. (Albert-street, N.W. 1), pointed out that the price of their "Nujol" has now been considerably reduced, and that "Mistol"

is now supplied in an improved atomiser with a cap.—[87] Behring Institute (Marburg-L., Germany, and W. Bredt, 41, Great Tower-street, E.C. 3) were showing again their delightfully convenient "Vacuum Venule" for the collection of blood samples, as well as "Yatren" in pills, powders, and solutions, and "Yatren-Casein" for protein shock therapy.—[49] Bristol-Myers Co. (112, Cheapside, E.C. 2) showed "Sal Hepatica," a saline regulator; "Ziratol," a non-toxic naphthaline antiseptic; and "Ipana," a tooth-paste containing Ziratol.—[6] G. W. Carnrick Co. (Brooks and Warburton, Ltd., 40–42, Lexington-street, W. 1) needed no introduction with their "Hormotone," "Trypsogen," "Secretogen," "Kinazyme," and other glandular compounds, but reminded the profession of the care with which these are prepared and standardised.—[67] Deshell Laboratories, Ltd. (Braydon-road, N. 16), argued once more the superiority of "Petrolagar" in its four forms: plain, unsweetened, alkaline, and with phenolphthalein. They laid stress on its value for cleansing, evacuating, or retention enemata, as it is miscible with anything, allays spasm, and holds the medicament in even dissemination on the mucous surface.—At Stand [26] Eno's Fruit Salt (Pomeroy-street, S.E. 14) held its own, and was a refreshing draught in the heat of the opening day.—[14] Ichthyol Co., Ltd. (18, Adam-street, W.C. 2), introduced "Albichthon," a colourless sulphur preparation from the raw material of ichthyol, an effective bactericide and clean to handle. Bristow's medicated "Ichthyol" toilet preparations were also on view.—[17] Jeyes' Sanitary Compounds Co. (London) showed a refined preparation of "Cyllin" for medical and surgical use, with a Rideal-Walker coefficient for *B. typhosus* of 24 to 26; as well as capsules for intestinal antisepsis, pastilles for the throat, soap powder, and dental and shaving cream.—[7] Kaylene, Ltd. (7, Mandeville-place, W. 1), this year emphasised the value of their colloidal silicate of alumina in infantile diarrhœa.—[71] Mond Staffordshire Refining Co., Ltd. (47, Victoria-street, S.W. 1), showed for the first time the "Monsol" products: pastilles, ointment, capsules, and anti-mosquito stick. The manufacturers maintain that Monsol is practically non-toxic and can be used intravenously, and that a 1/1000 solution is equivalent to 1/40 lysol at one-tenth of the price.—[84] The Saccharin Corporation, Ltd. (72, Oxford-street, W. 1), showed "Novocain" in powder, tablets, and solution, and "Glaucosan," a new and very strong myotic prepared by Dr. C. Hamburger, of Berlin, for the treatment of glaucoma.—[57] Scott and Turner, Ltd. (Gallowgate, Newcastle-upon-Tyne, and 211, Blackfriars-road, E.C.4), dispensed "Andrews' Liver Salt" as in previous years with no sign of diminished activity.—[83] The Semprolin Co., Ltd. (18, Leather-lane, E.C. 1), prepare a wide range of emulsions of high viscosity paraffin, of which perhaps the most interesting are those containing respectively guaiacol and salol. "Carmex" is a soothing laxative mixture for infants. The firm are glad to find that the fact that their products are entirely British is being appreciated by the medical profession.

3. *Toilet Preparations.*

[33] Kolynos Inc. (Chenies-street, W.C. 1) and [31] Pepsodent Co. (42, Southwark Bridge-road, S.E. 1) presented their well-known dental creams. The former also showed a skin soap, liquid Kolynos for mouth-wash or gargle, and a denture powder, and the latter demonstrated the rotary cleansing action of their "Decoater" toothbrush.

Food and Drink.

[32] Benger's Food, Ltd. (Otter Works, Manchester), displayed the unique features of their food by a series of slides, and reminded the profession of the value of their peptonised beef and chicken jelly, extract of red marrow, and essence of rennet.—[44] Cadbury Bros., Ltd. (Bournville), emphasised the food value of milk chocolate, in every half-pound of which there are one and a half glasses of full cream milk.—[51] Maison Ackermann-Laurence (St. Hilaire-street, Florent, France) gave special prominence to an exhibit of sparkling Saumurs; their Brut Royal is free from tannic acid and excess of sugar and alcohol, and is rich in ethers. On the same stand Messrs. Francesco Cinzano, of Turin, exhibited Italian vermouth free from preservatives, wormwood, and wood spirit.—[1] Energen Foods Co., Ltd. (Willesden, N.W. 10), showed their wide range of foods, originally prepared for diabetic patients but now used in all metabolic disorders (see THE LANCET, 1927, ii., 1337). Their "Endobran" biscuits are prepared according to Dr. Poulton's formula, with a low carbohydrate and a high fat content.—The attendance at Stand No. 95, that of William Gaymer and Son, Ltd. (Attleborough and London), showed no sign of diminishing during the whole of the Exhibition. Their "Special Dry Still" cyder is recommended for diabetics and sufferers from gout. Sufferers from heat benefited from their "Medium Dry" and "Medium Sweet."—[30] Granose Foods, Ltd. (Watford), showed their crisp, steam-cooked biscuits made from whole wheat.—[93] H. A. G. Coffee Co., Ltd. (40, Theobalds-road, W.C. 1), dispensed refreshing cups of their coffee, and showed alarming specimens of the caffeine which had previously been extracted from the bean.—[80] Horlick's Malted Milk Co., Ltd. (Slough, Bucks), have added to their well-known milk preparation a pleasant malted milk toffee, and lay stress on the value of their shadow-food, consisting only of two ounces of malted milk, four ounces of barium sulphate, and water. A new mixer was also demonstrated.—[65] Ingram and Royle, Ltd. (45, Belvedere-road, S.E. 1), showed the many mineral waters for which they are agents, including Vichy-Célestins, Contrexeville, Carlsbad, and Hunyadi János.—[23] Keen, Robinson and Co., Ltd. (Carrow Works, Norwich), testified to the continued success of Almata as a food for infants, invalids, and nursing mothers, and have issued a new prescription for the preparation of their "Patent Barley," so that the mother is saved the trouble of preparing barley-water first. Robinson's Groats, Robinson's Oats, and Keen's Mustard Ointment need neither introduction nor recommendation.—[8] Montgomerie and Co., Ltd. (Ibrox, Glasgow), showed Berina Infant Foods and Berina Malted Milk invalid diet, as well as Bermaline Bread.—[70] Nestlé and Anglo-Swiss Condensed Milk Co. (6 and 8, Eastcheap, E.C. 3) emphasised the vitamin content, bacterial purity, and dietetic value of their full-cream milk and malted wheaten products.—[45] Oxo, Ltd. (Thames House, Queen-street-place, E.C. 4), had a new preparation, "Liveroid," for pernicious and general anæmia. To their "Oxoid" standardised endocrine preparations they have now added an ovarian and a parathyroid.—[61] Alexander Riddle and Co., Ltd. (Bancroft-road, E. 1), demonstrated practically the refreshing properties of Stower's Lime Juice, Lemon Squash, and Orange Squash.—[11] Vitalia, Ltd. (17A, Boniface-street, S.E. 1), showed that "Vitalia" Meat Juice with soda-water could be a refreshing drink as well as a valuable food.—[82] West Surrey Central Dairy Co., Ltd. (Guildford), have added to their well-known "Cow and Gate" infant food two new preparations: "Brestol," a humanised cream of standardised fat, protein and vitamin content, and "Lacidac," an acid milk powder with a hydrogen-ion concentration when reconstituted of pH 4·6.

Surgical Instruments.

[46] and [63] Messrs. Allen and Hanburys, Ltd. (48, Wigmore-street, W. 1), called especial attention to their improved "St. Bartholomew's Hospital" pattern operation table, with new patent self-locking device for obtaining the Trendelenburg position, overhung by the "Pantophos" shadow-free light, in which heat and glare are eliminated. Among their large selection of stainless steel surgical instruments may be mentioned Souttar's craniotome, scalp clips, and steam cautery; Sargent's skull and laminectomy instruments; Tudor Edwards's thoracotomy instruments; Rowland's fasciatome for living sutures; Cope's universal "Duralumin" splint for Colles

fracture; gynæcological instruments made for Messrs. Comyns Berkeley and Victor Bonney, and rectal instruments for Sir Charles Gordon Watson; the "Rotanda" blood transfusion syringe; a unique ratchet for retractors; British cystoscopes, and the light "Oslite" head-lamp.—[9] Albert Brown, Ltd. (Chancery-street, Leicester), showed a selection of stainless steel instruments and electric sterilisers, in particular Georg Wolf bladder instruments with Zeiss optics, a true-colour filter being built into them so that the eye can follow the movements of a lithotrite and see the bladder contents in their natural colours without fatigue. An interesting head lamp for ear, nose and throat work was fitted w th an iris diaphragm and focusing lenses, so that the light could be intensified on a small area without dazzle.—[93A] Perhaps the most interesting exhibit in the whole show was that of Cameron's Surgical Speciality Co. (15, Stratford-place, W. 1). This apparatus provides, at a price well within the reach of the general practitioner, an endoscopic and inspection series which can be illuminated from any electric light plug and which the makers guarantee to be absolutely shock-proof and "fool-proof." The nasal sinuses can be trans-illuminated, root apices revealed, and foreign bodies detected; the retina can be lit up by pressing the bulb against the lower eyelid, and the veins are thrown into strong relief by pushing it into the soft tissues of a limb, so that intravenous injection in fat subjects loses its horrors. For the surgeon there are abdominal lights, which are guaranteed to withstand repeated sterilisation by boiling or steam pressure. The light used is of a wave-length peculiarly suitable for penetrating soft tissues. We advise every practitioner to inspect this for himself.—[76] C. W. Dixey and Son (13, St. Andrew's-crescent, Cardiff, and 3, New Bond-street, W. 1) showed a series of ophthalmoscopic instruments, particularly the Aves deviograph for testing the muscles of the eye.—[42] Down Bros., Ltd. (21 and 23, St. Thomas's-street, S.E. 1), included in their exhibit ox-bone plates and screws by Hamilton Bailey; Howarth's improved model of Chevalier Jackson's bronchoscopy and œsophagoscopy instruments; Souttar's counterpoised direct electric motor; Ivan Magill's portable intratracheal apparatus for anæsthesia; blood transfusion apparatus by Macintosh and others; and the "Up-to-Date" operation table with recent improvements.—[73] The Genito-Urinary Manufacturing Co., Ltd. (28A, Devonshire-street, W. 1), who are also agents for J. Eynard, Paris, showed a wide range of cystoscopes, bladder and kidney instruments, and diathermy apparatus.—[52 and 69] The Holborn Surgical Instrument Co., Ltd. (26, Thavies Inn, E.C. 1), had on view a large selection of modern surgical instruments in ordinary and stainless steel, including Kidd's female urethroscope; MacReynold's tonsil artery forceps; Guttmann's self-retaining vaginal speculum; the "Speclite" lamp, to clip on to the nose-piece of a shellite spectacle-frame, and the light, compact "Holborn" pocket head-lamp with elastic head-band.—[34] Mayer and Phelps (Chiron House, 59–61, New Cavendish-street, W. 1) pointed out their "Empire" operation-table, in which the Trendelenburg position can be obtained with perfect safety, and in which an improved lumbar bridge has been incorporated; Rowling's anæsthetic table; an outfit to supply a warmed atmosphere of either oxygen, nitrous oxide, or carbon dioxide, or of any percentage combination, with or without chloroform vapour; the "Chiron" fool-proof chloroform inhaler; Eadie's ligature forceps; and Canny Ryall's portable pelvic elevator.—[19] Rayner and Keeler, Ltd. (9, Vere-street, W. 1), showed various ophthalmoscopes and perimeters and a modified simple ophthalmic bracket which can be fastened above the patient's head and swung round in front of him. They also had on view various operating lamps and test types.—[12] The Surgical Manufacturing Co., Ltd. (83–85, Mortimer-street, W. 1), had a selection of new diagnostic instruments, including the Lilliput head-lamp; a new mercurial sphygmomanometer; a new combined ophthalmoscope, laryngoscope, and auroscope; the Servic steriliser for dressings, and a convenient new iodine container by means of which tincture of iodine can be carried about in a pocket and applied to the patient without staining of clothes or instruments.

(To be concluded.)

Special Articles.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Statistics of Venereal Disease.

IN December of last year a census of venereal patients was taken by the Health Office and the results have now been published. It is stated that the registration schedules sent to the medical profession have been answered by 93·6 per cent. of the general practitioners, 95·5 per cent. of the venereologists, and 97·5 per cent. of the hospitals and sanatoriums to whom they were sent, from which it is evident that the profession has taken great interest in the inquiry. The figures show that in Germany there were 18,608 patients who first came for treatment within the period Nov. 15th to Dec. 14th. Of these, 432 suffered from more than one venereal disease, 76 per cent. had gonorrhœa, 2·1 soft chancre, 5·3 per cent. primary syphilis, and 15·1 per cent. secondary syphilitic symptoms. Compared with 1919 the figures indicate a reduction by one half.

Phosgene Poisoning.

The regrettable accident at Hamburg, where an escape of phosgene caused the death of about 20 persons and the illness of some hundred others, has drawn our attention to the properties of this poison. Prof. Straub, of Munich, states that it is a very labile substance much used in the chemical industry—for instance, in the production of fuchsine. It may easily be condensed into a fluid and on contact with wet air this fluid is decomposed, developing chlorine and hydrochloric acid. These corrode the bronchi and produce broncho-pneumonia. Phosgene may also enter the living cells and bring about their death and has thus a delayed effect on the organism. The gas is produced when chloroform vapours come in contact with a flame, and intoxication from this cause used to occur sometimes in the days before operating theatres were fitted with electric light.

An International Conference on Scarlet Fever.

A conference of German and Russian medical savants, medical officers, and hospital physicians was held not long ago at Königsberg for the purpose of exchanging views on scarlet fever. Dr. Deicher (Berlin) said that in his experience antistreptococcal serum had proved very efficacious, no patient having died to whom the serum was administered in an early stage of the disease. When serum was used complications also had been rarer and less severe. Prof. Korschun (Moscow) and Dr. Bardach (Odessa) described methods of testing the efficacy of the individual serum. The Russian members of the congress reported that in their country prophylactic injections had been made in some 100,000 children and it had been ascertained that the protection lasted about nine months. This short duration is somewhat surprising as persons who have had scarlet fever are generally immune for a long period—even for the rest of their lives.

Cerebral Research.

The German Institute for Cerebral Research, founded by the late Prof. Kräpelin, has now been

formally opened. For a long time its financial basis was somewhat insecure, for the capital had been lost by the inflation of currency; but Prof. Kräpelin succeeded in interesting the Rockefeller Institution in the matter, and they furnished the necessary funds on condition that a certain sum was collected for working the institute. The fund thus opened found subscribers both in Germany and the United States, including Baron Krupp, of Essen, and Mr. James Loeb, of New York, and at last it has been possible to open the new building. It has departments for histopathology, topographical anatomy, serology, genetics, and psychology respectively. A chemical department under the celebrated analytical chemist, Prof. Willstätter, is to be opened in the near future. Besides the lavishly fitted laboratories there are rooms for collections and archives. At the opening ceremony, which was held in the presence of State and municipal authorities, Prof. Bouman, of Utrecht, presented a sum of M.20,000 (£500) in the name of a foreign committee. The Kräpelin gold medal was conferred upon Prof. Oscar Voigt, of Berlin, for his researches in the structure of the cerebral cortex.

Venereological Expedition to Russia.

The German Association for Aiding Scientific Research, in coöperation with the Health Department of the Soviet Republic and the Russian Academy of Sciences, has arranged an expedition to Russia for the study of syphilis. It is stated that in Europe syphilis has undergone an alteration under the influence of civilisation. It is thus essential to study it among a rather primitive population where it has been systematically combated for only a few years. As a suitable locality the Burjato Mongolian Republic situated beyond Lake Baikal has been chosen. Two German medical men went there last year to select a place for the research and they found that a town called Kulskoe would be convenient for the purpose because it possesses a hospital. The German Association has supplied the necessary apparatus and has fitted out a large serological laboratory. The Russian Government have promised to care for the housing and the maintenance of the staff, to have the hospital enlarged and modernised, and to facilitate as much as possible the work of the expedition. Acquired and hereditary syphilis will be studied by bacteriological and serological methods, and the results compared with those obtained in Europe. The expedition will include syphilologists, internists, and neurologists, and the German party, which will work under the direction of Prof. Hessner, of the Clinic for Venereal Diseases in Breslau, includes Dr. Klemm and Dr. Patzig, of the Institute for Cerebral Research in Berlin, Dr. Beringer, of the University Clinic for Nervous Diseases in Heidelberg, three women laboratory assistants, and an engineer to look after the apparatus. From Russia, where the Government shows great interest in the work, eight medical men, belonging to the staff of the State Institute for Venereal Diseases, will attach themselves to the expedition.

Dr. Wentzler, head of an infants' home in Berlin, says that in his institution the throat of every infant, even if healthy, is daily examined by a nurse, redness or any other abnormal condition being at once reported to the doctor. This makes it possible to detect suspected cases of illness at the earliest possible moment, and so prevent epidemics of diphtheria and scarlet fever from developing. Owing to the recent increase of diphtheria observed here, he recommends that the same measures should be taken in the schools. A nurse should be placed at the school entrance, whose duty it would be to examine the throat of every child. Where any reddening was discovered entrance to the school would be refused until the child had been examined by the school medical officer, who would decide whether an infectious disease was developing, and whether the child might be admitted to school.

MEDICINE AND THE LAW.

Imprisonment for "Nature Cure Practitioner."

MEDICAL practitioners are thinking quite as much of the public as of themselves when they deprecate the indiscriminate and unskilled use of ultra-violet ray and similar treatments. The possibilities of this kind of thing in the hands of amateurs are endless. During last month William Patrick Faulkner, a carpenter, was prosecuted at Marylebone Police-court on charges of obtaining certain sums by false pretences from Ernest Rose, another carpenter. It appeared that the two had entered into partnership and had opened a sun ray clinic and nature cure establishment in Praed-street, with a brass plate describing them as "Drs. Faulkner and Rose, nature cure practitioners and manipulative surgeons." Faulkner had made an agreement with Rose, which it was stated was signed "William Patrick Faulkner, M.D.," providing that each of them should put £50 into the concern and that they should share the profits. It was said that Faulkner told Rose he had just come from Ruskin College, Oxford, and was qualified as a doctor of medicine at King's College, also that he owned a house at Thornton Heath worth £1000. Believing these representations, Rose seems to have parted with about £130 in all. This included £4 which Faulkner seems to have obtained for the purpose of registering with the General Medical Council and 8 guineas for the purpose of registering with the L.C.C. Faulkner was not in fact on the Medical Register and did not pay the 8 guineas to the L.C.C. Mr. Wallace, appearing for the Director of Public Prosecutions, said Faulkner had been previously convicted for falsely pretending to be a registered medical practitioner, and also for obtaining money by false pretences. Mr. Wallace observed, as a warning of the dangers of sun ray treatment by unqualified persons, that one patient, who paid Faulkner a cheque for £6 and had treatment two or three times, was finally sent to hospital where she was found to be suffering from appendicitis. Had she continued her treatment with "Drs. Faulkner and Rose" much longer she would probably have ceased to require any treatment at all. Mr. Bingley, the magistrate, who passed sentence on Faulkner of three months' imprisonment with hard labour on each of two charges (making six months in all), agreed as to the grave danger to the public if people carried on such treatment unless properly qualified. The London County Council will presumably take note of the case. If their statutory powers of controlling such establishments are inadequate, they should be amplified forthwith.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. R. F. MacMahon is placed on Retd. List with the rank of Surg. Capt.

Surg. Comdrs.: R. J. G. Parnell to *Barham*, and as squadron medical officer and for specialist duties (on transfer of flag); and G. H. Hayes to *Warspite* (on transfer of flag).

Surg. Lt.-Comdr. S. R. Johnston to *Vulcan*, temp.

Surg. Lts.: J. J. Keevil to *Barham* (on transfer of flag); and C. H. Egan to *Warspite* (on transfer of flag).

Surg. Lt. (D) H. V. Pell to *Pembroke* for R.N. Barracks, Chatham.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lts. J. M. McC. Wright and J. Stephen to *Victory* for Haslar Hospl., for training.

Prob. Surg. Sub-Lts. E. G. Thomas, R. P. Davies, and D. A. Williams to *Victory* for Haslar Hosp. for training.

ROYAL ARMY MEDICAL CORPS.

Majs. to be Lt.-Cols.: H. T. Wilson, vice Lt.-Col. H. C. Sidgwick, to retd. pay; and R. C. Hallowes, vice Lt.-Col. (Bt. Col.) P. H. Henderson, promoted.

Capts. to be Majs.: R. D. Cameron (Prov.), W. J. F. Craig, J. Bennet (Prov.), W. C. Connell, and G. B. Wild.

Lts. to be Capts.: T. A. J. M. Dodd, R. A. Bennett, W. H. Carter, W. A. D. Drummond, J. G. E. Vachell, J. N. Atkinson, J. D. Corner, and J. T. Smyth.

Lt.-Col. H. C. Sidgwick retires on retd. pay.

Majs. A. W. Howlett, G. S. Parkinson, and J. Startin retire on retd. pay.

Temp. Lt. D. J. Allan relinquishes his commn.

TERRITORIAL ARMY.

Maj. J. H. Owens to be Lt.-Col. and to comd. the 161st (E. Anglian) Fd. Amb., vice Lt.-Col. (Bt. Col.) S. J. Fielding, vacated.

Maj. T. E. A. Carr, from T.A. Res., to be Capt., and relinquishes the rank of Maj.

W. H. Marston (late Surg. Sub-Lt., R.N.V.R.), J. K. Steel, and H. W. Walter to be Lts.

INDIAN MEDICAL SERVICE.

Capts. to be Majs.: Bishambhar Sahai, Manohar Lal Bhargava, D. V. O'Malley, Tirath Ram Khanna, and S. Dutt.

Temp. Lts. to be Temp. Capts.: Ganeshrao Venkatrao Gollerkeri, and Bercut Narain Khan.

COLONIAL MEDICAL SERVICES.

Dr. H. G. Holdbrook, Medical Officer, Federated Malay States, to be Senior Medical Officer, Selangor; Dr. W. H. Hart, Medical Officer, Federated Malay States, to be Senior Medical Officer, Perak.

Dr. S. P. Joseph, Mr. M. Jinadasa, and Dr. A. A. M. Weeraperumall, medical officers, to be Provincial Surgeons, Ceylon.

The following appointments have been made: Capt. P. H. Martin, Pathologist to the Institute of Medical Research, Federated Malay States; Dr. G. E. M. B. Dodds and Dr. C. E. M. J. Libert, Medical Officers, West African Medical Staff; Miss G. Lowe, Medical Officer, Nigeria; Dr. G. M. M. Menzies and Dr. W. Hunter, Medical Officers, West African Medical Staff.

DONATIONS AND BEQUESTS.—As the result of the recent Westminster Hospital Week, which was organised by representatives of the principal firms in Westminster, the institution has received £3500.—Mr. William Lyon, Carnoustie, left £500 each to the Dundee Royal Infirmary and the Forfar Infirmary to be applied to name a bed after him.—Mr. John Norman Dickinson, of Cockermouth, Cumberland, left £500 each to the Whitehaven and West Cumberland Infirmary and the Cumberland Infirmary, Carlisle, and £200 to St. Dunstan's Hostel for the Blind.—Mr. John Denniston Wilson, of Shaftesbury-avenue, London, and formerly of the Mercantile Bank of India, Batavia, Java, who left £57,188, after a number of private and other bequests amounting to £20,000, gave £1000 to the Hospital for Sick Children, Great Ormond-street, London, and the residue of the property to the executors for charities and hospitals.—Miss Alice Isabella Avery, of Athelney, Torquay, besides other bequests, left over £7000 to charities, including £1000 each to the Edinburgh Medical Missionary Society and the Children's Emigration Homes, and £500 to the Birmingham Medical Mission.—The Manchester Board of Guardians have decided to contribute £1000 towards cancer research.—Mr. Edward Palgrave Simpson, of Durham Villas, Phillimore-gardens, London, left, among other bequests, £2000 to St. Dunstan's Hostel for the Blind; £1200 to the Jenny Lind Infirmary, Norwich; £1000 each to Dr. Barnardo's Homes and the National Lifeboat Institution; £500 each to the West London Hospital, the National Industrial Home for Cripple Boys, Kensington, the Royal Hospital for Incurables, Putney, S.W., the Kensington District Nursing Association, the Church of England Homes for Waifs and Strays; £250 each to the Children's Country Holiday Fund, the Girls' Friendly Society, and the Holiday Cottage, Aston Clinton; £200 to the Norfolk and Norwich Hospital; £100 each to the After-Care Association, the Institution for the Indigent Blind, Norwich, the Eye Infirmary, Norwich, the Children's Convalescent Home, Lowestoft, and to the National Benevolent Institution.—Mr. Arthur Frederic Pope, of Manchester, among other bequests, left £500 to the Northern Counties Hospital for Incurables, £500 to the Manchester and Salford Hospital for Skin Diseases, and £500 to the Manchester Royal Infirmary.

Correspondence.

"Audi alteram partem."

SMOOTH AND ROUGH VARIANTS OF BACTERIA.

To the Editor of THE LANCET.

SIR,—The letter by Surgeon-Commander Sheldon F. Dudley in THE LANCET of August 4th emphasises the present difficulties in attempting to analyse and classify the observed variation in bacteria. Names such as "smooth" and "rough" given to special instances of variation in the intestinal group have perhaps rather rashly been transferred to superficially similar variants in other groups. Morphological studies of colonies by Baerthlein and others, though of great importance in establishing that such variations do occur, do not of themselves lead very far on account of the great variety of the colonies, the uncertainty of the criteria based on colony morphology alone and the gradations between different types of colony.

It was in the hope of advancing the study of variation further along the path indicated by Baerthlein that the present writer described a particular kind of variant distinguished by three somewhat diverse characters—namely, irregularity of the edge and surface of the colony, agglutinability in salt solution, and alteration in the agglutination by serum. Though this group of characters which constituted the variant called "rough" in *Bacillus dysenteriæ*, *B. typhosus* and allied bacteria appears to represent a fundamentally changed race, still the change is not always complete and the three characters may to some extent vary independently. This also applies to a fourth character—absence of pathogenicity—which has since been determined in certain "rough" variants. The independent variability of the characters is perhaps often not so much due to the want of uniformity in the elementary factors in a given variant as to the observed characters not being sufficiently elementary to correspond exactly to the fundamental factors. Further observation and scrutiny tends to reveal the really essential units which themselves are concerned in variation.

As an example of diverse variants which are superficially alike may be mentioned the "medusa-head" colonies in *B. anthracis*, *B. subtilis*, streptococcus, and occasionally in *B. typhosus*. The appearance of this form of colony is due to growth of the bacteria in long chains or threads often without any other constantly associated change in the antigenic or other characters. Such colonies are probably in part responsible, as has recently been remarked by F. W. Andrewes, for the different observations as regards virulence, &c., obtained with colonies which appear alike. On account of the irregularity of surface "medusa-head" colonies have sometimes been called "rough" and a resemblance in virulence, antigenic properties, &c., to other "rough"-looking colonies, which are essentially very different, is expected unwarrantably. It is surely undesirable to decry the quest for "laws" or "rules" in variation because apparent exceptions occur, considering the complicated biological processes involved.

The promised publication by Commanders Dudley and Parker on the toxigenicity of different colony forms of *Corynebacterium diphtheriæ* will be welcomed by other bacteriologists, especially if it is possible to identify the forms which they have found with the two well-known colony variants formerly described by Cobbett and by Sclawyk and Manacatide, who did not find any change in virulence in their variants, or with the "non-virulent" variant with a special colony form recently obtained by M. Cowan Maitland from several virulent strains. In these researches the authors procured the variants pari passu with the more normal forms from virulent cultures.

It is not quite clear whether the S and R forms, which Commanders Dudley and Parker found to be contrasted in toxigenicity, were from different sources or were both derived in each instance from a single strain. In the former case the reasons for believing that they were all *C. diphtheriæ* are required to complete the evidence. Definition of a species in bacteria is difficult as Commander Dudley admits, and the assignment to *C. diphtheriæ* of a culture which is neither toxigenic nor descended from a toxigenic strain is a difficult and often unconvincing task.

The study of variation in bacteria is not yet very far advanced, but definite variation in antigenic constituents has already been described in several instances and found related to more obvious changes in character. There is also good evidence that antigenic composition may be closely connected with some factor in the composite character known as virulence. This is notably the case in the factors which have been studied both chemically and biologically by Avery, Heidelberger, and others—e.g., in the pneumococcus. It therefore seems probable that even in so variable a group as the bacteria tangible evidence of orderly variation will further accumulate and prove to be of wide theoretical and practical value.

I am, Sir, yours faithfully,

JOSEPH A. ARKWRIGHT.

Lister Institute, S.W., August 7th, 1928.

THE HEREDITARY AND CONSTITUTIONAL FACTOR IN ADDISON'S (PERNICIOUS) ANÆMIA.

To the Editor of THE LANCET.

SIR,—In your annotation last week on the Intestinal Bacteria in Pernicious Anæmia you state that the evidence for an hereditary or constiutional element in the disease is "rather nebulous." In a lecture published in THE LANCET five years ago I brought forward what I regarded as conclusive evidence in favour of such an hereditary or constitutional element. I believe this conception is of fundamental importance in the pathogenesis, prophylaxis, and treatment not only of Addison's anæmia (A.A.), but also of the associated nervous disease—subacute combined degeneration of the spinal cord (S.C.D.). I should like once again to summarise the evidence on the subject, as many further observations bearing on it have been made since the publication of my lecture.

The absence of hydrochloric acid from the gastric secretion appears to be the one essential predisposing cause of the two allied diseases. It is most frequently due to constitutional achylia gastrica, an inborn error of secretion, which is strictly comparable with Garrod's inborn errors of metabolism, such as cystinuria, alkaptonuria, and pentosuria. The error is one of function and not of structure, as the mucous membrane is normal and has a normal number of oxyntic cells. Achylia was present in 4 out of 100 healthy students examined by Bennett and Ryle at Guy's Hopsital; it occurs in early childhood, and is often present in several members of a family. Martinez has observed more than 20 such families, in one of which a great-grandmother, her daughter, four grandchildren, and five out of 13 great-grandchildren had achylia. I have had under my own care a brother and sister and two sisters with digestive symptoms caused by achylia gastrica.

The familial occurrence of achylia gastrica must be the explanation of the familial occurrence of A.A. which has been recorded by many observers. I have collected no less than 62 family histories from the literature, and 7 out of a series of 25 cases at New Lodge Clinic (27 per cent.) had one or more relations who had died of the disease.

Liepelt records the case of a mother and daughter both of whom suffered from S.C.D., and of a father and son with the disease, the grandfather having died of A.A. Willson, in 1912, described the case of a woman with S.C.D., two of whose maternal aunts had died of A.A. I have set with a similar family history in 4 out of 16 private patients with the disease: the mother of one and the paternal grandfather of another died of A.A. The most remarkable case was that of a doctor who died of S.C.D. associated with achylia gastrica and A.A.; his brother, father, paternal uncle, and paternal grandfather had all died of A.A. The brother of another doctor with severe A.A. and slight S.C.D. was found to have S.C.D. and achylia, but perfectly normal blood.

Five patients, who have consulted me for various conditions associated with achlorhydria, had one or more relatives who had died of A.A. I have collected records of 28 other cases in which A.A. in one or more members of a family was associated with achylia in others. The brother of a doctor of 42, who consulted me for digestive symptoms due to achlorhydria, had died at the age of 41 after being ill for 18 months with S.C.D. and terminal severe anæmia, and Evans has described the case of a man with S.C.D. and achlorhydria but no anæmia who had a sister with achlorhydria. Dorst has described a family, different members of which had either A.A. or S.C.D., or achlorhydria without nervous symptoms or anæmia.

A woman of 50, who was feeling quite well except for occasional diarrhœa and eczema, sought my advice mainly because she had become worried about herself owing to the number of relations on both sides of her family who had died of Addison's anæmia. Her sister, paternal grandmother, and a cousin of her father's had died of it, a paternal cousin of her own had it now, and her mother died of it. Her tongue, which had been sore from time to time for three years, had the characteristic appearance of Hunterian glossitis. Her hæmoglobin percentage was 76 with 4,100,000 red corpuscles per c.mm., and the average size of the red corpuscles was increased from the normal of 7·23 μ to 8·34μ, but the red cells were otherwise perfectly normal in appearance. She had complete achlorhydria.

In connexion with the bacteriology of Addison's anæmia I regret that you make no reference to the important observations of Knott on the subject, most of which have been published in the Guy's Hospital Reports, as the more recent investigations of Dr. Stanley Davidson, which form the basis of your annotation, do little more than confirm his pioneer work.—I am, Sir, yours faithfully,

ARTHUR F. HURST.

New Lodge Clinic, Windsor Forest, August 6th, 1928.

INSTRUCTION IN PSYCHIATRY.

To the Editor of THE LANCET.

SIR,—Your review of Dr. H. J. Norman's book on Mental Disorders (July 21st, p. 125) will be approved by many of the older school of psychiatry. Yet it is disconcerting to find approval of a book, intended for students, on the ground that it does not deal with modern psychopathology. The most elementary knowledge of mental processes is withheld from our students. The metaphysical nature of the effort to correlate disordered conduct with disordered neurones, and its entire failure and practical futility in the psychoneuroses, are concealed from them. The mental attitude thus induced often persists throughout professional life in people of a certain temperament. Others make the discovery that something is wrong with their education or philosophy and feel helpless when faced with the many psychoneuroses of general practice, with only their traditional training in "neurones" to fall back upon. I am often asked by practitioners where they can learn about these matters, and where they can meet others of similar inclination to discuss their clinical difficulties and find out what is to be learnt from modern psychopathology. For this reason I ask the indulgence of your columns to notify that an effort is being made to form a small

society with these aims and I shall be pleased to hear from any would-be supporters.

I am, Sir, yours faithfully,

Harley-street, W., July 24th, 1928. ESTELLE COLE.

*** Dr. Cole raises a very important point, but our reviewer has not exactly approved the absence of teaching in psychopathology so much as conveyed the opinion that so important and difficult a subject should be properly taught or left alone. We have seen instructions in manuals of psychiatry which could have but little relation to the counsels which would be given by lectures to students out of first-hand experience.—ED. L.

CANCER AND THE BLOOD-GROUPS.

To the Editor of THE LANCET.

SIR,—In general practice there are occasions in which cancer appears to be a family disease, and on the other hand, some family strains appear to be immune. If not already dealt with and known, an investigation of the relative incidence of cancer in the different blood-groups might prove interesting.

I am, Sir, yours faithfully,

PENROSE WILLIAMS, F.R.C.S. Edin.

Cornwall, August 6th, 1928.

HOME PRODUCTION OF COCAINE.

To the Editor of THE LANCET.

SIR,—In an annotation entitled The Traffic in Narcotic Drugs, which appeared in your last issue (p. 236), you refer to the manufacture of cocaine in this country and state that hitherto there has been no production of cocaine from the leaves, or by refining crude cocaine, in Great Britain, adding that in 1927 a licence was granted to a firm of manufacturing chemists to carry on experiments in such manufacture. You will be interested to learn that cocaine was manufactured by us in 1903 at the Wellcome Chemical Works, Dartford. We were granted a Home Office licence in March, 1917, and have manufactured many thousands of ounces of cocaine at Dartford.

We are, Sir, yours faithfully,

BURROUGHS WELLCOME AND CO.

Snow-hill-buildings, London, E.C.,
August 8th, 1928.

SMOKE ABATEMENT INQUIRY AT BRADFORD.—Mr. F. O. Sandford, of the Ministry of Health, recently conducted an inquiry at Bradford into the application by various West Riding authorities for new by-laws on the smoke nuisance. The proposed by-laws provide that the emission of black smoke for two minutes in the aggregate within any continuous period of 30 minutes should constitute a nuisance. The authorities applying for the by-laws were Bradford, Huddersfield, Leeds, Halifax, Dewsbury, Batley, Spenborough, and Guiseley. In support of the application it was stated that the decision to apply for new by-laws arose out of a recommendation by a regional smoke abatement committee for the West Riding of Yorkshire, which represented something like 100 local authorities and a million people, and that committee approved of the terms of the suggested by-laws. In Bradford alone there were 438 industrial chimneys and 1330 furnaces. During the last seven years there had been 73 proved cases of smoke offences, and one firm had been prosecuted 70 times. The standard adopted in regard to smoke nuisance varied widely in the districts concerned. Amongst others evidence in support of the application was given by the medical officers of Bradford and Leeds. In opposition to the proposed by-laws by various trade associations and chambers of commerce it was stated that it had been proved by experience by firms with the most modern plant that it was impossible to comply with the terms of the by-laws. It could not be worked in practice, except by imposing a tremendous burden on industry. It was contended that the existing local Acts in Bradford were quite sufficient to deal with the problem.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

PROROGATION OF PARLIAMENT.

PARLIAMENT was prorogued on Friday, August 3rd, until Tuesday, Nov. 6th. The Royal Assent was given by Royal Commission to a large number of Acts passed during the past session.

HEALTH ADMINISTRATION IN SCOTLAND.

On Tuesday, July 31st, the House of Commons went into Committee of Supply on a vote of £2,037,515 for the salaries and expenses of the Scottish Board of Health. Mr. JAMES HOPE was in the chair.

Mr. W. ADAMSON said the subject he wished to raise was the deterioration of the physical condition of the Scottish people due to the inadequate provision that was being made for them by the Scottish Board of Health. There were a number of causes that were leading to the poverty-stricken conditions in which a large number of Scottish people found themselves to-day, but the main cause was unemployment. That problem was even more severe in Scotland than it was in England. Nearly one-third fewer miners were being employed to-day than were at work in 1924. In many cases the unemployed persons had been out of work for a considerable time. In Glasgow the period of unemployment ranged from six months to six years. This problem was bearing very heavily upon the local authorities in Scotland, and particularly upon the parish councils. He wished to impress upon the Secretary for Scotland that the provisions made in these estimates to deal with the problem of poverty and distress in Scotland were quite inadequate. In last year's estimates they had £260,000 in grants made to parish councils in respect of poor relief, but this year there was not a single penny. He appealed to the Secretary for Scotland to examine this problem closely with a view to more being done by the Scottish Board of Health to enable Scotland to shoulder this grievous burden.

Dr. DRUMMOND SHIELS said that that was the last time they would discuss the report as the report of the Scottish Board of Health. In the valedictory foreword which the members of the Board had inserted in the report they expressed the belief that the efficiency of the work of the department in future would not be inferior in any way to that of the Board. Although Labour Members had strongly opposed the change that was to be made they sincerely wished that the high standard of efficiency associated with the Board of Health would be maintained under the new régime. He wished to know what was the position with regard to the vacancy in the medical membership of the Board. It was known for a long while in advance that Sir Leslie Mackenzie was going to resign. Could the Secretary for Scotland now intimate who his successor would be? He sincerely hoped that when the appointment was made it would be found that a member of the present staff had been promoted to the position.

Milk-supply and Tuberculosis.

The question of the milk-supply and tuberculosis was, he said, dealt with in the report. Undoubtedly under the effective administration of Dr. Leighton a very great improvement had taken place in the milk-supply of Scotland. It was much cleaner and better than it had ever been. There had been a gratifying increase in the quantity of licensed graded milk, but it still amounted to little more than 1 per cent. of the whole milk used in Scotland. The nomenclature of the grades was very misleading. There was no doubt that Grade A in bulk, which was only the third of the qualities, was considered by many people to be the first quality, while the tuberculin-tested milk had not got its proper position in the public mind because of confusion of Grade A milk with that of the highest quality. Some revision of that nomenclature ought to be made, so that the public could understand properly what the position was. He would like to know if the Secretary for Scotland was satisfied with regard to pasteurised milk? If pasteurisation was carried out effectively this milk was safe, but there was a great liability for pasteurisation to be done ineffectively, and to be a danger rather than a help by misleading people as to its safety. The report did not deal with the point. Was any definite standard laid down; if so, was it being enforced; and had there been any cases where pasteurisation, which was becoming almost the most popular form of protecting milk, was regarded by the Department as being wholly safe and to be trusted?

The report stated that last year 2240 animals, mostly cows, were condemned as tuberculous, compared with 1852

in 1926. The Board of Health considered that the increased number was a sign of increased efficiency in the inspectorate, and if that was so, he was glad, but it also showed that there was still a substantial amount of tuberculosis among cattle in Scotland. In view of the danger to young children, especially the poorest, it was well that effective steps should be taken to deal with the matter. Even the Empire Marketing Board were now publishing placards inviting people to use more milk, but in view of the fact that the former percentage of tuberculous milk was 8 per cent., he would hesitate to recommend anyone with young children to use ordinary milk unless he was satisfied—which he was not—that that percentage had been reduced almost to vanishing point. It would be a good thing if the right hon. gentleman could reassure the public mind as to the quality of the milk, in view of the propaganda that was being carried on for increased consumption. The report contained a chapter on venereal disease. What was the position of the department in regard to that subject? The chapter in the report was very cautiously written, but it showed that the technical heads of the department were not at all satisfied with the position. The large sum of £60,000 or £70,000 was being spent in Scotland alone in dealing with this disease, and something like £600,000 throughout the Kingdom. Yet in Scotland the percentage of defaulters was 51. That showed an appalling waste of public money. The local authorities in Scotland were of opinion that the present arrangements were not satisfactory or efficient.

Coöperation Between Hospitals.

The question of coöperation between hospitals was being very carefully considered by many bodies, both in England and Scotland. The voluntary hospital managers were very much concerned at the present position, and the question of coöperation between the voluntary, municipal, and poor-law hospitals was bound to arise in connexion with the proposed local government changes. In Aberdeen there was an arrangement that seemed to be very desirable. The parish councils there had handed their hospitals over to the Public Health Committee of the town council, and the whole of the public health accommodation there was being administered by one authority. In Glasgow, also, there was a working arrangement of a similar kind. Many of the poor-law hospitals in Scotland were not well equipped or adequately staffed, and the association, with the municipal services, and with the staffs of the various voluntary hospitals, was bound to improve their efficiency. He was glad that the Department seemed inclined to encourage that. He would like to ask if the Secretary for Scotland had any information to give in regard to Craigleith Hospital. The position of that institution and Craiglockhart Hospital, he understood, was being considered and, in view of the shortage of beds in Edinburgh Infirmary, it would be as well if some arrangement of that kind were made as soon as possible. The report of the Mackenzie Committee stated that there was a shortage of 3600 beds in Scotland two years ago, and the position was not any better to-day. Did the Minister consider that adequate arrangements had now been made, or were likely to be made, to provide at an early date a proper number of beds? The Scottish Committee of the British Hospitals Association had set up five local committees for coördinating the various hospital activities, and there was also a liaison committee between those bodies and the Department. Why were there no representatives of the municipalities on that liaison committee? This ought not to be a matter purely between the managers of voluntary hospitals and the Department; the municipal medical services ought to be represented in any working arrangement of this kind, because there was in these negotiations a danger of magnifying to too great an extent the importance of the voluntary principle and to say that it must be preserved at all costs. The first consideration must be the efficiency of the hospital service and the supply of an adequate number of beds. While they acknowledged the important work which the voluntary hospitals had done, they regarded the voluntary agent as being the pioneer, and considered that when the necessity of the work was evident it should be done by the public authority, so that adequate medical attention might be given to all classes of the community.

What had happened to the report of the Departmental Committee on Maternal Mortality which was issued about 18 months ago? How many of its recommendations had been put into operation? There was no doubt that this subject must ultimately be dealt with by municipal maternity services, and by ensuring coöperation between doctors and midwives, and between the ante-natal services and the other public health services. He could not now go into the large question of the nutrition of school-children, but he called attention to the fact that last year 6·4 per cent. of school-children in Scotland were in a state of nutrition below the average, while 1·5 per 1000 were in a state of very poor nutrition. Was the Board of Health urging local authorities to put into operation the whole of their powers for feeding necessitous children? With all the poverty and misfortune in Scotland there was money enough to feed the children. The same consideration applied to the questions of the dental treatment of school children and treatment of adenoids, tonsils, and so on. There was no doubt that many of these children were suffering in health because of defects which, if their parents were in a better position in society and had more money, would be remedied as a matter of course; but because the parents were unable to afford it, and because the school medical service was not big enough and had not sufficient resources, they were left to drift very often into a state of chronic ill-health.

Mr. MACQUISTEN attributed the poverty of some districts of Southern Scotland to Irish incursion.

Mr. JAMES STEWART drew attention to the alarming figures in the report with reference to tuberculosis, both case-rate and death-rate being on the ascendant, especially in the Highlands and Islands.

Mr. T. HENDERSON called attention to the inadequacy of the efforts to suppress venereal disease in Scotland.

Reply to the Debate.

Major ELLIOT (Under-Secretary of State for Scotland) in replying to the debate, said that the Board of Health were keeping an anxious watch on the health of Scotland to see if deterioration was taking place—that deterioration which indeed one would expect from the long-continued industrial depression. They had not yet any evidence to lead to the conclusion that deterioration was taking place. The reports of medical officers of health on the school population did not indicate any deterioration in the health of the children of Scotland generally. They had kept a watchful eye on the vital statistics of the country. It was true that last year the pulmonary tuberculosis figures were higher than those of the year before, but they were lower than they had been for any year up to that time, lower than in 1921, 1922, 1923, 1924, and 1925. Non-pulmonary tuberculosis continued to fall and was lower last year than ever before. They all agreed as to the tremendous struggle through which industrial Scotland was passing and the Government were not blind to the situation. They recognised the urgent necessity to deal with it by legislation which would be laid before the House before the end of the present year. Dr. Shiels had said that the percentage of underfed and badly-fed children was too high and he (Major Elliot) agreed with him. They must continue to do their utmost by improving the school medical services and by tightening up regulations to make sure that the Education Act was carried out and that every child got sufficient nourishment to enable it to take advantage of education. There was no divergence of opinion between the Secretary of State and his advisers on the question of venereal disease. The report made it quite clear that in the opinion of the Secretary of State the time had not come to ask the House for further compulsory powers until they were sure that the powers already entrusted to the local authorities by the Government had been utilised to the full.

Dr. SHIELS said that the point he wished to make was that there was a divergence of opinion between the Scottish Board of Health and the English Ministry of Health and not between the Secretary for Scotland and his advisers.

Major ELLIOT said he could assure the hon. gentleman that the Secretary for Scotland was in no way inclined to defer to the opinion of the English Minister. He considered the matter on its merits in consultation with his technical advisers and in accordance with their advice he came to the conclusion mentioned in the report. The Scottish Board of Health were not flinching from drastic action to make sure that the milk-supplies were as pure as could reasonably be managed. In reply to Dr. Shiels's question as to the medical member of the Board of Health, everyone knew that Sir Leslie Mackenzie had now retired, and it was right that Parliament should take note of that fact and remember, with gratitude, the great work that he had done for the health of the people of Scotland—(general cheers)—during the many years that he had been entrusted with that duty. The reason that a new medical member had not yet been appointed to take his place was simply that the Bill for the Reorganisation of Offices in Scotland had not yet received the Royal Assent. As soon as that Bill became an Act of Parliament the Secretary for Scotland would proceed with the utmost expedition to make the new appointment. He had nothing further to report for the moment in regard to hospitals, but the proposals that Dr. Shiels had brought forward would be considered. He was not able to say that the shortage of hospital beds had been remedied, but an improvement was being effected almost monthly, with the provision of increased

hospital accommodation for the sick people of Scotland. Only a few weeks ago he had opened the new Northern Infirmary at Inverness where considerably increased medical facilities had been made available for the people in the northern districts. With regard to the report of the Departmental Committee on Maternal Mortality, the Board had done their utmost to bring up to date the system in Scotland in regard to the services for pregnant women. The Maternity Homes Act ensured that there was now a service available for 100 per cent. of the mothers of Scotland, a thing that could be said of very few other countries in the world. The Board had not succeeded in reducing the very high percentage of deaths from puerperal fever, but they were considering fresh steps for dealing with that matter. The service had been made available, however, and they would do their utmost, by administrative action, to secure that further institutional accommodation was made available for women in childbirth. In regard to tuberculosis there were fluctuations from year to year, but what they had to observe was the general trend of the figures and that gave them no reason to despair or to feel that any serious inroads were being made on the health of the people of Scotland. As regarded tuberculosis in the Island of Lewis they had done their utmost to deal with that matter. Sanatoria had been opened and there were three whole-time men and three medical officers of health and assistants working part time on that problem. It might be that they were dealing there with a hereditary resistance which was lower than the resistance on the mainland, or in those parts of the country which had been longer exposed to the infection of the disease. They were, however, at present engaged in investigations to see whether that was the case or not. The nine years during which the Scottish Board of Health had presided over public health matters in Scotland had been years of varying fortunes, but as regarded health, housing, and social conditions they showed a distinct improvement. If they could make as much progress in the next nine years he would be satisfied.

Mr. JOHNSTON asked if the Under-Secretary could make some statement with reference to the practice carried on for some considerable time by one firm of importing inedible grease by the shipload from abroad and selling it to poor people as edible lard?

Major ELLIOT said that the Government took a serious and grave view of this matter. They felt that a definite offence had been going on. The local authorities upon whom the onus of prosecution fell had now the matter under consideration. The Government would not stand in the way of steps being taken, if they desired to take steps. The stock now under embargo in Glasgow would be dealt with as the order of the Court decided.

The vote was agreed to.

MINISTRY OF HEALTH VOTE.

On Wednesday, August 1st, the House considered the Report of a vote of £13,774,025 for the salaries and expenses of the Ministry of Health.

Mr. LANSBURY protested against the reduction which he said the Minister of Health was making in the grants for milk distribution, housing, and slum clearance, and poor-law relief.

Lieut.-Colonel FREMANTLE said that there had been presented to Parliament in the last two days a report from the Departmental Committee on Vaccination, which could not be taken into account so late in the session, but which must be referred to. Having enumerated the circumstances which led to the appointment of the Committee—certain objections to the practice of vaccination and certain doubts with regard to the necessity of its continuation on the present lines owing to the milder type of small-pox—he called attention to the danger represented by the large number of unvaccinated people which was increasing every year in proportion to the whole population, a circumstance which had an international aspect, because other countries held that vaccination was a very small price to pay for protection from a very alarming disease. Therefore action was required to be taken, and in the first instance a scientific committee was appointed to inquire into the nature of vaccination and into the various conditions which appertained to the operation of vaccination. That committee had presented a lengthy report which, from a scientific point of view, did great credit to its authors, and left the legislators very much in the same position as they were in originally from a practical point of view, for it showed that the position required further investigation on scientific lines.

Vaccination and Nervous Disorder.

There was one point which the report raised—it had been made a serious problem in the Press as well as in the House of Commons—and that was the occurrence in the period after vaccination of certain unfortunate cases of nervous disorder which had been stated by some hastily, and by others anxiously, as being possibly due to the operation of vaccination. This report dealt with those cases very thoroughly. They had to treat these exceptions in their proper light and proportion: and the report showed that they were a small number compared with the total number of vaccinations. The total number of cases with which the Committee dealt was 62, of which, unfortunately, a considerable number were fatal. They must recognise the seriousness of these facts; but when they were dealing with 314,000 primary vaccinations in one year 62 in all was a small number and they must not exaggerate its significance. The total number of deaths from vaccinia over a period of 15 years had only been 0·001 per 100 vaccinations. Still, these were facts which have to be faced and they who were such keen supporters of vaccination as essential to the community would be misleading the House if they did not face them. The report showed first of all that it was a curious thing that in the year 1924 the Committee could trace no cases whatever, although they searched most diligently through all the records of the results of vaccination, and those records were very complete. The Committee found some of these cases in 1922 and 1923. They found a close association between these cases and the epidemics of disease known as encephalitis lethargica and poliomyelitis. The conclusion that the Committee came to was that just as children suffering from scarlet fever, measles, and other ordinary ailments were more susceptible in a time of outbreak to poliomyelitis, so similarly those who had been vaccinated were liable to be attacked by these passing diseases in a time of epidemic. The Committee pointed out exactly the limits within which further observation was required, the points to which their sense of anxiety must be directed, and the directions in which in future they hoped to be able to find out exactly the nature of the trouble which had caused this symptom, which was entirely accidental both geographically—for it had occurred in Holland as well as in this country—and in years, and they might hope that they would not see them occur again.

The speaker looked forward to the improvement in vaccination administration that would follow its transference to the sanitary authorities, and deplored the conduct of those who, in defiance of the facts, tried to terrorise people on lines which every man who was sensible believed were scandalous exaggeration and malicious inventions.

Ministry of Health Estimates.

He would like to look shortly at the total estimates of the Ministry of Health. The total estimate for this year was £20,000,000, showing an increase of nearly £1,000,000 on last year, for excellent reasons. Of the £20,000,000 over half was due to housing, so that the public health side was under £10,000,000. The prevention of disease which was preventable had resulted, and was resulting, in an enormous improvement in the health and efficiency of the people as well as in their general habits. But the estimates for the Defence Forces amounted to £114,000,000. The real moral of the contrast between that large sum and the £10,000,000 spent on the prevention and cure of disease was that when there was a clear case made out for extra expenditure for the Ministry of Health there should be no question raised about it. If they could get general agreement on this on very side of the House he would suggest to those who, like himself, were keen on the prevention of disease and on improving the lot of suffering humanity, that they should be very careful what they supported and careful to avoid waste. There had been cases again and again where extra money has been asked really as an extra dole and not for the prevention of disease. They desired further provision to be made for the clearance of the slums. They must focus attention in the provision of housing for the very poor, and in order to do that it would be the duty of the State before long to remove the subsidy from the upper grades of houses, because the people who lived in those houses could look after themselves now.

Housing and Health Services.

Mr. HARRIS said the money which had been spent on housing and health services was most important, and it was more impressive when they remembered the immense improvement in public health during the last 15 or 20 years, largely due to schemes undertaken for that purpose. The various schemes which were initiated by the Government before the war had borne excellent fruit, and had justified the expenditure. In some boroughs, even in very crowded areas, the system of maternity and child welfare had had a remarkable effect on the death-rate. For instance, in Bethnal Green, the poorest neighbourhood in the whole of London, and the most overcrowded, they had reduced the infantile mortality to 57·7 per 1000. In that respect they

had been able to take the prize for the best result in London. That figure compared with 59 per 1000 for London as a whole, and 69 per 1000 for England and Wales, including the rural and well-to-do districts. Their infant death-rate had shown a steady decline. In 1916 it was 106 per 1000. In 1918 129 per 1000. It then came down to 90 in 1922, next to 71, and this year it was 57. That reflected very great credit on the medical officer and the loyal servants who worked with him. It was not unreasonable to say that this improvement was largely due to the distribution of free milk. There had never been a better expenditure of public money than the giving away of milk through the health departments of the local authorities. In Bethnal Green milk was given to expectant mothers three months before confinement, to nursing mothers, and to children up to 3 years. One pint per day was given, and that was not enough to demoralise any woman or any child. Except for children between 3 months and 18 months no larger quantity was given; it was then at the maximum of 1½ pints, and in that case a medical certificate was required. He could not make out why the Minister of Health had singled out this expenditure on milk for his special veto. He now said that milk should not be given away to mothers or their children who were in receipt of poor-law relief, directly or indirectly. He required a special medical certificate before even a pint of milk could be obtained. That was most unfortunate. It might be said why should not these people buy the milk themselves? Unfortunately milk was not a popular diet; and they had to do a great deal of education in that direction. The Empire Marketing Board was spending thousands of pounds in putting up posters urging people to drink more milk. Not only was the distribution of milk valuable from an educational point of view, but it was most important at this very sensitive stage of a child's life.

Tuberculosis.

The complex problem of tuberculosis had racked the mind of every Minister of Health and of every local authority. The medical officer of health in Bethnal Green had given great attention to the subject. In connexion with the death-rate from tuberculosis a very serious phase had been pointed out to him. There had been a very heavy and rapid mortality among patients who had died within a year of notification. In 1917 the percentage of patients dying within a year of notification in Bethnal Green was 21·9, and in 1922 the percentage was 26·9. They had taken the trouble to follow up the cases. The reason for this alarming death-rate had been given to him by their very able medical officer as due to the diffidence among patients in informing the authorities that they were suffering from the disease. A conference of local authorities in London had pointed to the great success of the experiment at Papworth, where industrial training was correlated with treatment. The Minister of Health might well spend a little time inquiring into that matter, and take steps to encourage those suffering from the disease to notify the authorities earlier. All these health questions were, however, connected with the housing problem. One of the difficulties in dealing with tuberculosis was that when a man returned nearly cured, he had to go back to a two- or three-roomed tenement, and share the house with a family of five or six children. He was not going to underrate what the Ministry of Health or the local authorities had done, but there was a little danger in the optimism which said that most of the lee-way had now been made up. Whatever the Minister might do in the way of reducing the subsidy on the more expensive houses, he must on no account consider for a moment reducing the subsidy on houses which were wanted to meet the real and urgent need of the working classes.

Captain BOURNE said that there were on the registers of local authorities some 363,000 people suffering from tuberculosis, and of that number some 63,000 were treated in any one year in sanatoria. The average stay of a man in a sanatorium was some 150 days, and the cost per patient was 49*s.* 3½*d.* per week. That meant that the total cost of sanatoria treatment was between £4,000,000 and £5,000,000 per annum. If it were certain that that sum would really effect the cure of tuberculosis, he did not think anyone would grudge the money, but the Minister, when he was asked if he had statistics to show how many of the people who passed through sanatoria were cured had to admit that he had no reliable information on that subject. There had been in his constituency recently an effort to deal with some of these cases by means of the tuberculin treatment. While that method had been reported upon unfavourably, it had nevertheless been tried in some localities with very beneficial results. The tuberculin treatment had one advantage. It did not require isolation in a sanatorium, and a man who was undergoing it could go about his ordinary occupation. It was a very much cheaper form of treatment than sanatorium treatment, and although he spoke with great diffidence as a layman, he felt that anything which might possibly be helpful to people suffering from this disease ought to be investigated by the Ministry.

Mr. BRIANT raised the question of the conditions in the hop districts. He said that having seen these conditions for himself, and having studied the reports of the medical officers dealing with them, he did not hesitate to say that in a large part of these areas the conditions were absolutely disgusting and unfit for any human being.

Colonel APPLIN asked if the Committee on Maternal Mortality had reported, and if so, what was the nature of the report? Were they going on in the same old way allowing mothers to die when their lives might be saved? When the Committee had reported would the Minister consider giving the same information to the poor women as was given by private doctors to those who were better off? As long as that information was withheld, they would have this great mortality among mothers, and go on rearing a generation of young people unfit to come into the world by reason of their mothers being unfit to bear them.

The Welsh Board of Health.

Mr. JOHN protested against the Minister's action in reorganising the Welsh Board of Health. Under the new scheme he said they were to have no Board of Health in Wales, but instead they were to have three officers in Cardiff carrying out the work of civil servants under the direct instructions of Whitehall, with no provision whatever for joint action under a duly appointed chairman.

Mr. LLOYD GEORGE said he very much regretted that it should have been necessary to raise this question at all in the House. He had hoped after the representations made to the Minister, not merely by his political opponents but by the whole of his political friends in Wales, that he would have made this concession to the unanimous wish of the Welsh people without distinction of party or creed. He urged the Minister of Health to reconsider this matter.

The Minister's Reply.

Mr. CHAMBERLAIN (Minister of Health) said the Welsh Board of Health had never been a board in the ordinary sense of the word, because a board in the ordinary sense was an executive body, and the Welsh Board of Health had never been an executive body since it was set up. The Welsh Board had never had the powers of the Scottish Board of Health. This was purely an administrative matter. As to the question of economy, when he decided for reasons which appeared to him sufficient and satisfactory, that he could not appoint any existing member of the Board to be chairman, he had to consider whether he should bring in somebody else. The work of the Board of Health had not been executive, and it had found so little to do that on the average it had met only three times a year during the last nine years. All its work had been done by its members in their individual capacity. It had been extremely efficiently done, and he had not heard any complaints about it. To bring in a chairman, who would really have no functions, at a cost of £1600 a year would be a course in which he would not be justified. It was not his desire to bring into publicity anything in the nature of a reflection upon any member of the staff in Wales. He thought it necessary, in receiving the deputation on the subject, to say something about it, and he thought that they would consider it as a private matter between themselves and himself, but since it had been made public he would say here was a case, not of any dishonourable action on the part of anybody, but of a series of petty personal squabbles that had taken place in the office. He had disciplined and censured those who had been guilty of subordinating the public interest to their own personal prejudices and feelings. The matter was settled, but to put one of those who had been concerned in these internal differences into a position in which he could or might affect the promotion of others with whom the differences had arisen, did not seem to him a step which he could possibly take in the interest of the administration of public health.

Poor-law Relief.

Dealing with the question of poor-law relief, Mr. Chamberlain said they had not found any cases of starvation. There were many cases of hardship, but if it was really to be laid down by the Labour Party that those who were unable to support themselves were to be supported by the State on the same scale as those in full work, he said that it could not possibly be done. Complaint had been made about the reduction of the grant for milk. He much regretted that it should be necessary to make any reduction, but they had to bear in mind that the practice of local authorities as regarded the amount of milk given varied enormously. Some gave nothing at all, and in other areas he expenditure was up as much as £20 per 1000 of the population. All authorities could not be equally right in

this matter. They had not laid down in a single case that this special form of assistance to nursing and expectant mothers was to be stopped. They had not forbidden any local authority to give milk or to give as much milk as it chose; all they had said was that they must limit the amount of the Exchequer grant, and the reduction was comparatively small. It was not a matter of policy on the part of the Ministry to reduce the amount of milk; if it had not been for economy he would not have done anything at all, but he would not like to admit that this economy was going to undo the work that had been done in the past in the preservation of infant life. What had happened was that having stated that the Exchequer grant in certain cases would have to be reduced, he had made certain suggestions which the local authorities could adopt if they desired to reduce their expenditure with the least possible disturbance to their existing practice.

Health Conditions in the Hop Fields: Sanatorium Treatment.

With regard to the hop fields the Ministry of Health had very little power beyond that of exhortation. What they needed in this matter was the education of public opinion. No doubt the conditions in the hop fields were very far from being what they should be, and he had done what he could to induce local authorities to adopt model by-laws, and to see that they were carried out. In the absence of further powers it was not possible for him to do more. Conditions were improving, though he agreed that there was much to be done. Captain Bourne had expressed some doubt as to whether they could be satisfied that the money spent on sanatorium treatment was justified by the results. They had not got figures from sanatoria all over the country which would show exactly what happened to people after they had been discharged, but some time ago they got from the Brompton Hospital Sanatorium particulars of between 3000 and 4000 patients who had been discharged. They showed in regard to the moderately advanced cases that after five years 57 per cent. of the males and 67 per cent. of the females were not only alive but apparently in good health; and that after ten years 38 per cent. of the males and nearly 50 per cent. of the females were also alive, and as far as he knew, in good health. That reassuring statement indicated that the money spent upon sanatoria was well spent; it prolonged the life of many people, and saved the lives of a good many others, and even where it was not able to do this, it did much to diminish the infection which otherwise might take place among the healthy population. In regard to housing, it was quite true that the progress made under the Rural Housing Act up to March, 1928, had been singularly disappointing, but in the three months since then progress had been very much faster. The number of dwellings in respect of which applications for assistance had been received, which was 1072 up to March, 1928, had increased to 1500 in the succeeding three months. In regard to housing in general, month after month not only the number of houses completed continued to go up, but also the number of houses under construction; and that number, which was only 48,000 last January, was to-day 59,000. He would be very much surprised if they did not get another 100,000 houses before the end of this year.

The vote was agreed to by 255 votes to 132.

THE LATE DR. HEYWOOD SMITH.—At the age of 90, Dr. Heywood Smith died at Chichester on July 25th. The son of Dr. Protheroe Smith, founder of the Hospital for Women, Soho-square, he was educated at Harrow and Christ Church, Oxford. His clinical training was obtained at St. George's Hospital, and on graduating in 1865 he held a house appointment there before taking up gynæcology as a specialty. He became M.R.C.P. Lond. in 1865, and proceeded to the M.D. degree at Oxford in 1870. Seven years later he published "Practical Gynæcology, a Handbook of the Diseases of Women," based on his experience on the staff of the British Lying-in Hospital and the Soho-square Hospital, to both of which he subsequently became senior physician. Other books and scientific writings followed, and Heywood Smith was one of the founders, and some years later president, of the British Gynæcological Society. On retirement from consultant practice in London he went to live at Hove, where he was living at the outbreak of the late war. Joining a veteran's corps, he was given medical charge of an air-raid station, and later did good work as civil medical officer to the Military Hospital at Chichester, where he finally established himself in retirement.

Dr. Heywood Smith, who was twice married, leaves a widow, two sons who are members of the medical profession, and a married daughter.

Medical News.

UNIVERSITY OF OXFORD.—At a congregation held on August 4th the degree of Bachelor of Medicine was conferred on T. L. Davies and A. J. Leslie-Spinks.

UNIVERSITY OF CAMBRIDGE.—Applications are invited for the Benn W. Levy Research Studentship, valued at £100 a year. They should be sent to Sir Gowland Hopkins at the Biochemical Department before August 14th.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At a meeting of the Council held on July 31st, Sir Berkeley Moynihan, the President, in the chair, diplomas of M.R.C.S. were conferred upon 158 candidates (130 men and 28 women) who have passed the requisite examinations and have complied with the by-laws of the College. These candidates are the same as those whose names were printed on p. 259 of our last issue, except that Nellie Brown (Westminster), David W. Currie (Leeds), Yatta Gimpelson (Royal Free and St. Mary's), Ralph H. Morley (Leeds), Bhavani Natarajan (Bombay), H. G. Nimbalker (Bombay and Middlesex), Margaret E. Peaker (King's Coll.), Edith J. L. Smith (Royal Free), G. N. Unnithan (Madras and Univ. Coll.), and Elsie E. Wright (Royal Free and St. Mary's) received their diplomas of Member at a previous meeting of the Royal College of Surgeons, and Thelma Shepherd (Royal Free) received her licence from the Royal College of Physicians on July 31st.

The Diploma of F.R.C.S. was conferred upon Herbert John Seddon (St. Bart.'s), who has passed the requisite examinations and has now attained the required age.

Licences in Dental Surgery were also conferred upon A. M. Bennett and H. A. Lewis, both of the Royal Dental Hospital.

Diploma in Tropical Medicine and Hygiene.—This diploma was conferred (jointly with the Royal College of Physicians) upon the following 33 candidates who have passed the requisite examinations:—

T. D. Amad, Maud C. Cairney, K. Cathiravelu, G. L. Chadha, S. S. Crosse, C. H. Devereux, J. P. M. Donnelly, N. M. Dotivala, Alice M. A. Downing, A. W. Duncan, H. A. Gilkes, M. A. E. Gohar, I. S. Gupta, N. Gupta, M. Jafar, H. C. Johnson, H. Kaitz, Mary Keith-Thompson, J. N. Leitch, K. R. Lundeberg, L. J. McGregor, C. D. Newman, Annie B. Price, E. L. Robert, A. N. Sharma, G. Singh, J. D. S. Thomas, R. F. Tredre, M. K. Tucker, K. H. Uttley, Kathleen A. Vernon, P. L. Whig, and E. R. Wide.

ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—As the result of the Final Examination of the Conjoint Board held in July, the following candidates were approved in the undermentioned subjects, but are not eligible for diplomas:—

Medicine.—S. Alstead, Liverpool; S. Annaswami, Madras and London; Nancy M. Badeley, Royal Free; S. W. Barber, St. Bart.'s; F. E. Camps, Guy's; Rochelle Churin, Royal Free; C. F. Cosin, Guy's; W. W. Craner, London; T. V. Crichlow, King's Coll.; H. W. D. Crook, Guy's; S. T. Crowther, Cardiff; T. M. Davie, Middlesex; E. L. Edmondson, Cambridge and London; C. N. Evans, St. Bart.'s; N. B. Fadia, Bombay and Middlesex; T. D. Finey and T. Fritz, London; Ruth C. Galletly, Royal Free; H. Gordon, Durham; I. Gordon, St. Bart.'s; E. Hacker, Leipzig and London; F. F. Hellier, Cambridge and Leeds; S. K. Jatar, Bombay and London; D. T. Jones and W. D. G. Jones, Guy's; S. Kin, King's Coll.; L. R. Lalwani, Bombay and London; Florence M. Lessing, Charing Cross; A. L. Light, Leeds; E. R. R. Mellon, Guy's; E. C. Murphy, London; D. A. Nicoll, King's Coll.; J. R. O'Neill, Leeds; C. R. L'E. Orme, Cambridge and King's Coll.; E. R. G. Passe, Melbourne and London; P. H. L. Playfair, Cambridge and King's Coll.; T. R. Plummer, Oxford and St. George's; H. D. Pyke, Bristol; T. G. Reah, Cambridge and London; H. Richards, Guy's; V. C. Robinson, Cambridge and St. Bart.'s; S. A. Scorer and S. Shone, Guy's; H. Stark, St. Bart.'s; B. Stewart, Cambridge and Leeds; B. P. Sur, Calcutta; P. R. Thambugala, Calcutta and Middlesex; Ercenwin A. Utting, St. Mary's; and Sybil O. Williams, Royal Free.

Surgery.—Annie D. M. Adams, King's Coll.; A. G. Adrain, St. Mary's; H. H. Aitchison, Oxford and London; G. G. Allan, Univ. Coll.; S. W. K. Arundell, Middlesex; C. P. Bailey, Cambridge and St. George's; J. R. J. Beddard, St. Bart.'s; J. B. Blaikley, Guy's; R. M. Bolam, Cambridge and Durham; B. J. Bouche, Guy's; J. J. Boulle, London; A. M. Boyd, St. Bart.'s; G. H. Bradshaw, Cambridge and St. Bart.'s; F. E. Camps, Guy's; C. E. Caudwell, Westminster; M. A. Chamberlain, Manchester; F. Clifton, Cambridge and St. Thomas's; J. O. Clyde, Middlesex; S. M. Cohen, Cape and Guy's; Elizabeth Cooper, Royal Free; Florence K. Costello, Charing Cross; J. F. Crabtree, Manchester; D. F. L. Croft, St. Bart.'s; H. W. D. Crook, Guy's; S. H. Croot, Cambridge and Guy's; L. E. Daniel, St. Thomas's; T. M. Davie, Middlesex; C. C. Davis, Univ. Coll.; C. J. M. Dawkins, Cambridge and Middlesex; D. C. L. Derry, St. Thomas's; P. C. C. de Silva, King's Coll.;

R. Doyle, Liverpool; J. T. Dunkerley, St. Bart.'s; H. A. Eason, London; Dorothy E. Eglington, Royal Free; J. S. S. Fairley, Cambridge and Birmingham; W. R. Forrester Wood, Cambridge and St. Bart.'s; G. H. V. Froggatt, Sheffield; M. Gamboa, St. Bart.'s; Dorothea L. Gee, Royal Free; W. N. O. George, Univ. Coll.; R. Glanvill, Guy's; D. R. Griffith, St. Thomas's; C. C. Griffiths, Liverpool; Gwendoline E. Grove, St. Mary's; F. R. Gusterson, St. Thomas's; W. G. Harvey, St. Mary's; C. F. Howes, St. Thomas's; Esme I. Hyam, Univ. Coll.; P. G. S. Kennedy, London; R. W. Knowlton, Cambridge and Middlesex; L. W. A. Lankester, Cambridge and St. Thomas's; J. C. Lee, Cambridge and London; A. Levy, St. Thomas's; K. Lindberg, Middlesex; A. G. Lloyd, Durham; O. V. Lloyd-Davies, Middlesex; R. M. B. Lowis, St. Thomas's; T. K. S. Lyle, Cambridge and King's Coll.; R. G. Macbeth, Oxford and King's Coll.; A. L. McFarlane, King's Coll.; E. R. R. Mellon, Guy's; K. G. Milad, St. Mary's; W. B. Millar, Middlesex; V. L. Misso, King's Coll.; G. Morgan, St. Mary's; G. H. Morley, Middlesex; L. H. Mottet and T. Nallainathan, Univ. Coll.; G. Na Ranong, St. Thomas's; G. S. Nightingale, London; Edith G. Niven, Univ. Coll.; W. G. Oakley, Cambridge and St. Bart.'s; R. I. O'Farrell, Sheffield; E. Ogden, Univ. Coll.; A. J. Parer and Keren I. Parkes, King's Coll.; C. T. E. Parsons, St. Bart.'s; A. P. Petigura, Univ. Coll.; A. S. Philps and I. Preiskel, St. Bart.'s; S. R. C. Price, King's Coll.; F. S. C. Pritchard, Guy's; C. B. Prowse, Cambridge and St. Bart.'s; H. D. Pyke, Bristol; A. F. Quarmby, Birmingham; T. G. Reah, Cambridge and London; J. B. A. Reynolds, Cambridge and St. Bart.'s; R. A. C. Rice, St. Bart.'s; G. L. Robinson, Cambridge and London; Alice I. Roughton, Cambridge; E. L. Rubin, Liverpool; D. J. Sagor, Cape and London; C. J. Sanderson, St. Bart.'s; G. H. Sanderson, Cambridge and Univ. Coll.; R. V. Sanzgiri, Bombay and London; N. Schachnowitsch, Guy's; C. P. Scott, St. Thomas's; Mary Scouloudi, Univ. Coll.; J. E. Semple, Cambridge and St. Thomas's; W. H. H. Serasinghe, Middlesex; Mary E. Sharp, Univ. Coll.; S. Shone, Guy's; F. J. G. Slater, Cambridge and Durham; E. Somasekhar, Birmingham; A. Somerville, Sheffield; A. G. C. Taylor, St. Thomas's; J. M. Taylor, St. Bart.'s; L. Taylor, Sheffield; K. A. Thomas, Birmingham; Phyllis D. Towell, Royal Free; S. A. Underwood, St. Mary's; M. H. Wace, St. George's; R. G. L. Waller, Westminster; C. J. Waring, London; C. M. E. Warner, King's Coll.; J. Wasserzweig, London; Olive C. Watkin, Charing Cross; K. Watman, Middlesex; C. E. W. Wheaton, St. Thomas's; D. C. Williams, Cardiff; G. M. Willoughby, Middlesex; Winifred M. Wright, Royal Free; N. Yacoubian, Birmingham; and H. S. T. Young, Cambridge and St. Thomas's.

Midwifery.—Margaret Abernethy, Royal Free; D. A'Brook, Univ. Coll.; Annie D. M. Adams, King's Coll.; A. G. Adrain, St. Mary's; H. F. Apthorpe-Webb, Cambridge and St. Bart.'s; Lucy E. Arthur, Nancy M. Badeley, and Vera R. T. Baylis, Royal Free; R. C. Bennett, St. Bart.'s; W. L. M.Bigby and J. B. Blaikley, Guy's; A. D. D. Broughton, Cambridge and London; H. H. Brown, King's Coll.; M. K. Bryce, London; D. S. Chowdhary, Punjab; J. O. Clyde, Middlesex; G. C. Cochrane, London; S. C. S. Cooke, Middlesex; P. A. Cooper, Univ. Coll.; Florence K. Costello, Charing Cross; D. W. C. Cox, Guy's; T. V. Crichlow, King's Coll; D. F. L. Croft and J. R. Crumbie, St. Bart.'s; T. J. Davies, Cardiff; C. C. Davis, Univ. Coll.; A. C. Dawes, King's Coll.; J. Donovan, Leeds; R. Doyle, Liverpool; W. J. D'Rosario, Guy's; M. A. A. El Gammal, Cairo; C. N. Evans and A. D. Everett, St. Bart.'s; D. Ezekial, Charing Cross; J. S. S. Fairley, Cambridge and Birmingham; W. B. Fiddian-Green, St. Mary's; C. H. Forsyth, London; R. H. Francis, Cambridge and St. Bart.'s; G. H. V. Froggatt, Sheffield; M. Frohlich, Brussels and Middlesex; R. L. Frost, Guy's; Ruth C. Galletly, Royal Free; B. C. Ghose, Durham; A. Gilpin, King's Coll.; R. Glanvill, Guy's; G. H. A. Graetz, Cambridge and St. Bart.'s; F. W. H. Grenier, London; D. R. Griffith, St. Thomas's; Bryneilen Griffiths and Rosentyl Griffiths, Cardiff; F. R. Gusterson, St. Thomas's; E. J. Hamp, London; Amy F. Hankins, Punjab and Royal Free; C. K. Haskard, Adelaide and London; Dorothy C. Hay, King's Coll.; J. Hopton, St Bart.'s; R. G. S. Howe, Univ. Coll.; Mary A. Hughes, Charing Cross; C. H. Johnson, Guy's; H. C. Johnson, Minnesota; W. H. P. Jonas, Oxford and St. Thomas's; Mary E. H. Jones, Cardiff; R. A. Jones, Cardiff; J. S. Kapadia, Univ. Coll.; Mary L. R. Kennard, St. Mary's; P. G. S. Kennedy, London; S. Kin, King's Coll.; R. W. Knowlton, Cambridge and Middlesex; M. Kokia, Westminster; L. W. A. Lankester, Cambridge and St. Thomas's; A. Levy, St. Thomas's; A. R. F. Lotaief, Durham; W. D. Lovelock-Jones, Cardiff; J. N. McArthur, Univ. Coll.; A. L. McFarlane, King's Coll.; Hilda M. C. Macmahon Garry, Liverpool; J. K. Marshall, Oxford and Guy's; S. N. Mathur, Lucknow; R. A. Maynard, Cambridge and St. Thomas's; W. B. Millar, Middlesex; G. Morgan, St. Mary's; G. H. Morley, Middlesex; L. H. Mottet, Univ. Coll.; E. C. Murphy and J. E. Myers, London; Q. St. L. Myles, Oxford and St. Thomas's; T. Nallainathan, Univ. Coll.; R. A. Nash, Guy's; T. H. Negus, St. Thomas's; P. L. Nirula, Punjab; E. Ogden, Univ. Coll.; J. R. O'Neill, Leeds; L. G. M. Page, St. Bart.'s; Keren I. Parkes, King's Coll.; A. P. Petigura, Univ. Coll.; I. Preiskel, St. Bart.'s; S. R. C. Price, King's Coll.; D. L. Pugh, Univ. Coll.; A. F. Quarmby, Birmingham; B. Rait-Smith, St. Bart.'s; Florence Ram, Cambridge and Sheffield; H. Richards, Guy's; R. D. Robinson, St. Bart.'s; Elizabeth B. Robson, Liverpool; T. S. Rodgers, Westminster; Irene H. Rogers, King's Coll.; B. Rothery, Cambridge and St. George's; H. W. Round, Birmingham; A. S. D. Russell, St. Thomas's; D. J. Sagor, London; H. K. Said, Charing Cross; G. H. Sanderson, Cambridge and Univ. Coll.; R. V. Sanzgiri, Bombay and London; J. E. Schneider, St. Thomas's; J. E. Semple, Cambridge and St. Thomas's; Mary C. Seward and Mary E. Sharp, Univ. Coll.; D. B. Smallshaw, Guy's; A. R. Smith, St. Thomas's; E. Somasekhar, Birmingham; A. Somerville, Sheffield; H. L. Spitz, Leipzig and Middlesex; V. Srinivasan, Madras; E. T. W. Starkie and Mary S. Stuart, St. Mary's; B. P. Sur, Calcutta; I. Taylor, King's Coll.; C. D. Trimble, Birmingham; S. A. Underwood, St. Mary's; Bertha D. Upton-Jones, Royal Free; M. H. Wace, St. George's; R. Warnecke, J. Wasserzweig, and S. N. Wasti, London; Olive C. Watkin, Charing Cross; L. H. Wharton, Bristol; C. E. W. Wheaton, St. Thomas's; J. S. Whiting, Cambridge and St. Bart.'s; A. W. Williams, Cambridge and Westminster; L. V. Williams, St. Bart.'s; G. M. Willoughby, Middlesex; W. R. Winterton, Cambridge and Middlesex; F. G. Wood-Smith, Cambridge and St. Bart.'s; M. G. Woolff, St. Thomas's; N. Yacoubian, Birmingham; and H. M. Yardley and H. S. T. Young, Cambridge and St. Thomas's.

Pathology (New Regulations).—Doris Ascough, Manchester; J. R. J. Beddard, St. Bart.'s; H. J. W. Bergh, St. George's; C. E. Caudwell, Westminster; S. C. S. Cooke, Middlesex; E. F. Hunt, St. George's; H. G. McGregor, Guy's; A. H. Nelson, Charing Cross; T. B. Pitts, Guy's; and J. E. C. Sayers, St. Thomas's.

ST. BARTHOLOMEW'S HOSPITAL AND COLLEGE.—The Old Students' annual dinner is to be held on Monday, Oct. 1st, with Sir D'Arcy Power presiding.

ROYAL COLLEGE OF SURGEONS IN IRELAND.—Honorary Fellowship of the College has been conferred on Dr. Hugh Hampton Young, clinical professor of urology in Johns Hopkins University, Baltimore.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—The College will be closed for the summer vacation from Monday, August 13th, to Saturday, Sept. 15th, both days inclusive.

ST. MARY'S HOSPITAL ANNUAL DINNER.—The past and present students' annual dinner of St. Mary's Hospital will be held on Friday, Oct. 5th, at 7.30 P.M., at the Trocadero Restaurant, with Dr. E. G. Moon in the chair. The hon. secretary is Dr. A. Hope Gosse.

EXTENSION OF PAIGNTON HOSPITAL.—Sir Mortimer Singer has laid the foundation-stone of an extension of Paignton and District Hospital. The addition provides 20 more beds, a new private ward, a new out-patients' department, and an enlarged operating theatre.

BY a vote of 25 to 12 Bournemouth Borough Council decided on July 31st to sanction the use of unclaimed bodies at the Park Prewett Mental Hospital for anatomical examination at the University of Oxford. The request came from the Ministry of Health through the medical superintendent of the hospital.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL.—Princess Louise, Duchess of Argyll, recently laid the foundation-stone of a wing named after her. It will consist of five floors, the lowest being occupied by a large out-patient department. Each of the other floors will have a ward of 15 beds with operating theatre and the necessary adjuncts. The two upper floors will not be completed, in accordance with the policy of the institution, until the money is in hand. The total cost will be £52,000, of which £28,000 is now available. Princess Louise stated that there is a waiting-list of over 2000 cases needing operative treatment.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—On August 13th begins a two weeks' course at the Infants Hospital, starting daily at 2 P.M. and consisting of lectures and demonstrations, together with special visits to other baby welfare centres. On August 27th the Queen Mary's Hospital will begin a two weeks' course in medicine, surgery, and the specialties. In the mornings there will be lectures and demonstrations, while in the afternoons there will be a choice of operations or medical, surgical, or special clinics, followed by a lecture after tea. Special courses in September have been provided as follows: Psychological medicine at Bethlem Royal Hospital; medicine, surgery, and specialties at Westminster Hospital; children at the Queen's Hospital; electrotherapy at the Royal Free Hospital; ophthalmology at the Royal Eye Hospital; orthopædics at the Royal National Orthopædic Hospital. In October the Fellowship will again arrange weekly clinical demonstrations in medicine, in surgery, and in ophthalmology, also a special series at the Wellcome Museum of Medical Science, and a series of lectures on gynæcology, children's diseases, and minor surgery. Detailed syllabuses and other information may be had from the Secretary of the Fellowship at 1, Wimpole-street, London, W. 1.

A COURSE of study on Digestive Pathology will be held at the Hospital de la Santa Cruz at Barcelona from Oct. 5th to Dec. 10th under the direction of Prof F. Gallart y Monés. Application for enrolment should be made to the Administración del Hospital de la Santa Cruz, Depositaría, Barcelona.

PRIVATE PATIENTS AT NORWICH.—Since the Private Patients' Department of the Norfolk and Norwich Hospital was opened in April last, 70 patients have been admitted, and recently not only has every bed been occupied, but there is already a small waiting-list. Payment of 30*s.* a year ensures treatment for a married man and his wife, with children under 16 whose income does not exceed £550 per annum; for a man and his wife, with no young children, whose income does not exceed £450, and for a single person with not more than £350 per annum.

CHRISTMAS MEDICAL TOUR ON THE CÔTE D'AZUR.—For the fifth year in succession a Voyage Médical International is being planned after Christmas to places of medical interest on the Mediterranean littoral. The rendezvous is Marseilles on Wednesday, Dec. 26th, to be followed by a day spent in visiting that port and another at Toulon. Then on successive days will be reached Hyères, St. Raphael, Cannes, Le Cannet, Grasse, Juan-les-Pins, Antibes, Nice, Menton, Monaco, Beaulieu, with opportunity for visiting the Roman citadel of La Turbie, the prehistoric grottoes of Grimaldi, the laboratory of Dr. Voronoff, the observatory of Nice, and other objects of scientific interest. Demonstrations and historical lectures will be given. For further information apply to the President of the Société Médicale du Littoral Méditerranéen, Dr. M. Faure, 24, rue Verdi, Nice, A.M., France.

THE LATE DR. C. H. NEWBY.—Dr. Charles Henry Newby, who died at his home in Ilfracombe on July 11th, was born at Ryde, Isle of Wight, in 1849, and was educated at the Merchant Taylors' School. After qualifying as M.R.C.S. in 1873 he held house appointments at St. Thomas's Hospital, and became surgical registrar there. As surgeon for the National Aid Society he was decorated with the Fourth Order of the Turkish Medjidie after the Turco-Serbian War of 1876. In 1880 he took the diploma of F.R.C.S. Eng. and in 1885 joined the expedition sent to Khartoum for the relief of General Gordon. For his part in this campaign he received the English war medal and the Khedival Star. In the following year he saw service in the Turco-Bulgarian War, gaining the Red Cross of Serbia and the Order of St. Save. Settling in practice at Southsea he became medical officer for out-patients at the Royal Portsmouth Hospital. On retirement to Ilfracombe in 1904 he associated himself with the work of the Tyrrell Cottage Hospital, and acted as its treasurer for many years. He leaves a widow and two daughters.

RATING OF LANCASHIRE HOSPITALS.—A conference to decide the basis of assessment for various buildings of a public character has been held at Manchester between the County Valuation Committee and the Rating Authorities and Assessment Committees of Lancashire. Seventeen assessment committees and 119 rating authorities were represented. It was decided that voluntary hospitals should be assessed, gross, at from 20*s.* to 30*s.* per bed, including the beds of the staff, with additions for facilities for outdoor and special treatment, and paying patients. Rate-maintained hospitals are to be assessed, gross, at from £2 to £4 per bed of patients and staff, likewise with additions for outdoor and special treatment. This scale is to be applied also to mental hospitals, sanatoriums, and similar institutions, with additions where they are justified on account of recreation and other purposes.

THE LATE DR. D. P. COOPER.—The death is reported from Surat, at the age of 93, of Dr. Dosabhoy Pestonji Cooper, a pioneer of Western medicine in the Bombay Presidency. Educated at the Grant Medical College, Bombay, where he graduated in 1863, he was two years later appointed medical officer to the Parekh Dispensary at Surat, where he settled in practice. He was first president of the Surat Medical Association founded in 1886 and in the following year was appointed Khan Bahadur for his public services. In 1899 he was awarded a certificate of merit for his work during the plague epidemic, and for a time he acted as civil surgeon for the city. For nearly 50 years, from 1867, he served the municipality as councillor and he was an honorary magistrate. Among other distinctions conferred upon Dr. Cooper was the Fellowship of the University of Bombay, and he was appointed honorary assistant surgeon to the Viceroy in 1885, receiving the Kaiser-i-Hind silver medal. He was a staunch and active Freemason for over half a century. Of his sons two are members of the medical profession.

KING GEORGE HOSPITAL.—In the recent special distribution of the Wells legacies, King Edward's Hospital Fund for London set aside a grant of £10,000 towards the building fund of King George Hospital, subject to conditions to be agreed. The Fund has been informed that steps will shortly be taken to invite the support of the charitable public for the establishment of the hospital. The scheme, as submitted to the King's Fund, contemplates the provision of additional hospital accommodation for the parts of Essex immediately to the East of London, including the area for which such accommodation is particularly needed owing to the development of post-war housing. The King's Fund proposes to summon a conference with a view to facilitating the execution of the scheme.

THE LATE DR. J. W. MELVILLE.—At the early age of 24 Dr. John Walter Melville died at Liverpool on July 22nd after an operation for appendicitis. Educated at the Barrow-in-Furness secondary school, and at the University of Liverpool, he qualified as a medical practitioner and as a dental surgeon in 1926, and graduated as M.B. in the following year. Last October he was appointed tutor in dental surgery in the University of Leeds, but it was his intention to take up general surgical work, and he resigned this appointment in order to take up the post of resident house surgeon at the Royal Southern Hospital, Liverpool, which he held at the time of his death. The funeral took place at Rampside, near Barrow, on July 25th.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W.

Special two weeks Course in Infant's Diseases at the Infants Hospital, Vincent-square, Westminster.

MONDAY, August 13th.—2 to 3 P.M., Dr. W. E. Robinson: Cases of Malnutrition and Intestinal Toxæmia. 3 to 3.45 P.M., Dr. Eric Pritchard: Lecture-Demonstration. Caloric Values. 4 to 5 P.M., Dr. Eric Pritchard: Lecture, General Principles of Nutrition.

TUESDAY.—2 to 3.45 P.M., Dr. Eric Pritchard: Feeding Cases. 4 to 5 P.M., Dr. M. Maizels. Pathological Demonstration. Cerebro-spinal Fluid.

WEDNESDAY.—2 to 3 P.M., Dr. W. E. Robinson: Cases of Rickets and Scurvy. 3 to 3.45 P.M., Dr. Eric Pritchard: Lecture-Demonstration. Modification of Cow's Milk. 4 to 5 P.M., Dr. Elizabeth Karn: Lecture-Demonstration. Ultra-Violet Rays.

THURSDAY.—2 to 3.45 P.M., Dr. Eric Pritchard: Cases of Tuberculosis. 4 to 5 P.M., Dr. W. E. Robinson: Lecture, Respiratory Diseases in Infancy.

FRIDAY.—2 to 3 P.M., Dr. Eric Pritchard: Cases. 3 to 3.45 P.M., Dr. Eric Pritchard. Lecture-Demonstration. Diet of Children. 4 to 5 P.M., Mr. D. Levi: Lecture, Pyloric Stenosis.

SATURDAY.—2 P.M., Visit to Home for Blind Babies, Chorley Wood; and to the Infants Hospital Convalescent Home, Burnham Beeches.

SUNDAY.—11 A.M., Visit to V.D. Centre, Thavies Inn, Holborn-circus. Prophylactic Treatment of Syphilis in Infants.

Appointments.

CAMPBELL, W. S. H., M.B., Ch.B. Edin., D.P.H., has been appointed Chief Medical Officer of Health to the Lindsey (Lincs.) County Council.

HOARE, E. F., M.D., Ch.B. Liverp., Coroner for East Sussex, in succession to the late Dr. W. A. Dow.

MACDONALD, A. D., M.B., Ch.B. Edin., Reader in Materia Medica and Therapeutics, University of Manchester.

SAUNDERS, J. C., M.B., B.Ch., D.P.H. N.U.I., Superintendent Medical Officer of Health and Tuberculosis Officer for Cork-le-Boro.

Certifying Surgeons under the Factory and Workshop Acts: BRAND, W. H. E., F.R.C.S. Edin. (Banchory, Kincardine); and LEWIS, W. B. A., M.B., B.Ch. Camb. (Oswestry, Salop).

Vacancies.

For further information refer to the advertisement columns.

Aberystwyth, Aberystwyth Infirmary and Cardiganshire General Hospital.—H.S. £200.

Ayr County Hospital.—Jun. H.S. At rate of £80.

Barry Accident and Surgical Hospital.—H.S. At rate of £200.

Bath, Royal United Hospital.—Asst. H.S. £100. Also H.S. and H.P. Each £120.
Bedford County Hospital.—H.S., also Asst. H.S. At rate of £175 and £130 respectively.
Birmingham, General Hospital.—Med. Reg. and Res. M.O. £155.
Bolton, Townleys Hospital, Farnworth.—Second Asst. M.O. £225.
Bootle, Bootle Borough Hospital, Derby-road.—Sen. M.O. Also 2 Jun. M.O.'s. Each at rate of £150 and £125 respectively.
Bradford, Municipal General Hospital (St. Luke's).—H.P.'s and H.S.'s. Each at rate of £200.
Canterbury, Kent County Mental Hospital, Chartham.—Jun. 4th Asst. M.O. £300.
Canterbury, Kent and Canterbury Hospital.—Hon. Surg. to Ear, Nose and Throat Department. Also Third Res. M.O. At rate of £125.
Cardiff, Prince of Wales' Hospital.—H.S. £100.
Carmarthen, Joint Counties Mental Hospital.—Jun. Asst. M.O. £300.
Dreadnought Hospital, Greenwich.—Surg. to Out-patients.
East London Hospital for Children and Dispensary for Women, Shadwell, E.—H.P. At rate of £125.
Glasgow, University of.—Gardiner Chair of Physiological Chemistry.
Ilkeston, Borough of.—M.O.H. and School M.O. £800.
Leeds, City of.—Asst. M.O.H. for Maternity and Child Welfare. £800.
Leicester, City Education Committee.—Asst. School M.O. £600.
Maidstone, Kent County Mental Hospital.—Med. Supt. £1000.
Manchester Royal Infirmary.—Jun. H.S. At rate of £100. Also Hon. Asst. Radiologist and Electro-Therapeutist.
Market Drayton, Salop, Cheshire Joint Sanatorium.—Asst. M.O. £250.
Newcastle-upon-Tyne, Wingrove-road, Westgate-road.—Res. M.O. £250.
Nottingham Children's Hospital.—Res. H.P. At rate of £150.
Nottingham City.—M.O.H. £1440.
Oldham Royal Infirmary.—H.S. At rate of £175.
Plymouth, Homœopathic and General Hospital.—H.S. At rate of £100.
Reading, Royal Berkshire Hospital.—3rd H.S. £150.
Rotherham, Rotherham Hospital.—H.P. £180.
Royal Northern Hospital, Holloway, N.—H.S. At rate of £70.
Swansea General and Eye Hospital.—Hon. Phy. Also Sen. Res. O. £250.
West Bromwich, West Bromwich and District General Hospital.—Res. H.S., H.S., also Cas. H.S. Each at rate of £200.
Western Ophthalmic Hospital, 155, Marylebone-road, N.W.—Jun. Non-Res. H.S. At rate of £100.
West London Hospital, Hammersmith-road, W.—Non-Res. Cas. O. £5 5*s.* per week.
Winchester, Royal Hampshire County Hospital.—Hon. Physician.

Births, Marriages, and Deaths.

BIRTHS.

JEPPS.—On July 27th, at St. Quentin, Broadstairs, the wife of Dr. J. W. W. Jepps, of a son.
LINELL.—On July 22nd at Wellesley Hospital, Toronto, to Frances, wife of Dr. Eric A. Linell—a daughter.
LLOYD.—On August 1st, at 29, Bramham-gardens, S.W., to Olive, wife of W. Ernest Lloyd, M.D., M.R.C.P.—a son.

MARRIAGES.

DAGGETT—SIMPSON.—On July 30th at St. Martin-in-the-Fields, London, William Ingledew Daggett, M.A., M.B. Camb., F.R.C.S. Eng., to Eileen Hilda, youngest daughter of Colonel and Mrs. Simpson, of Fowey, Cornwall.
LEWIS—IRVINE.—On July 31st, at All Saints' Church, Panarth, Kingsley Wassell Lewis, M.B., B.S., M.R.C.S., L.R.C.P., to Florence Henrietta, third daughter of the late Henry O. Irvine, of Southerndown, and of Mrs. Irvine, of Salisbury-avenue, Panarth.
MACINNES—MASTERMAN.—On August 1st, at St. Giles's Church, Camberwell, the Rev. Angus Campbell Macinnes, to Florence Isabella Joy Masterman M.B., B.S. Lond.
MARTIN—GARFIT.—On July 31st, at Partney Church, Lincolnshire, Peter Henry Martin, B.M., B.Ch., M.R.C.P., to Phyllis Mary Garfit, third daughter of the late Bartholomew Claypon Garfit and of Mrs. Garfit, of Dalby Hall, Spilsby.
MUNRO—LOWTHER BOUCH.—On August 2nd, at Ackworth Parish Church, James Gibson Munro, M.B., Ch.B., of Kimberley, Nottingham, to Lilias Anne, eldest daughter of J. Lowther Bouch, Rector of Ackworth.
SCHOLEFIELD—DEAN.—On July 28th, at Caerphilly, South Wales, Bernard Graham Scholefield, D.M., F.R.C.S., to Queenie, younger daughter of Mr. and Mrs. C. H. Dean, of Berwyn, Caerphilly, South Wales.

DEATHS.

BURT.—On August 5th, at Langdale, Salisbury-avenue, Harpenden, William Burt, M.B., B.S. Lond., late of Finchley.
CARROLL.—On August 1st, at 3, Artillery-mansions, Woolwich, Louis Ely Reginald Carroll, M.R.C.S., L.R.C.P.
HENTSCH.—On August 1st, George Frederick Hentsch, L.R.C.P., M.R.C.S.
MARSH.—On August 1st, at Mosley House, Boothstown, James Marsh, M.B., C.M., late Medical Officer of Health, Atherton.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

THE RED CROSS IN TIME OF PEACE.

AFTER ten years of peace it is well to be reminded that this generation can never lose the scars of war; the work of the Red Cross emphasises facts which most of us find it easy to forget. The eighth report of the joint council of the Hospital of St. John of Jerusalem and the British Red Cross Society, which covers only nine months, shows that their excellent work for ex-Service men has continued actively. During this period 308 tuberculous officers were helped, bringing the total since 1914 to 17,798. As time goes by, applicants find it increasingly difficult to satisfy the Ministry of Pensions that their disability is due to war service, and the Red Cross gives the necessary assistance while a case is pending. Other officers have finished their course at a sanatorium, but need financial aid in securing specialties of diet while on home treatment. Others, again, are helped with travelling expenses to Switzerland or the Riviera. The hospital at Brighton was filled the whole time, and some of the patients were very seriously ill when admitted.

An important activity of the fund is the provision of materials and training in various handicrafts for pensioners who cannot train in the hospital workshops. Approximately 1000 men were helped in this way during the nine months. The industries taught are increasingly popular and the medical superintendents speak highly of the great benefit conferred. Ex-Service men in Ministry of Pensions' hospitals are sent Christmas presents of the value of 5*s.* each, and over 2000 of them were cheered in this way on Christmas Day, 1927. About 13,000 men were taken out for drives or rides, or transported to entertainments. Although a number of Ministry hospitals have been closed, the diminution in the number of men still under treatment is not very great; they are simply being concentrated in larger institutions. The Emergency Help Committee, founded to give temporary emergency relief to ex-Service men and their widows and dependents, has also continued active. Many men, handicapped by disability, have been rendered self-supporting. 18,353 new cases were assisted during 1927, but no fewer than 12,187 applications were refused on the ground that there was no definite end in view or that they were ineligible or undeserving. One activity of this committee is to provide motor attachments to invalid chairs, and already 357 heavily disabled pensioners have thus been enabled to travel about without fatigue. The Games and Comforts Fund made 238 grants for wireless and cinema apparatus, musical instruments, cigarettes, clothing, bagatelle and billiard tables, gramophones, and all kinds of outdoor and indoor games. The Spero Firewood Factory for tuberculous ex-soldiers had to be closed down, but was fortunately able to reopen as the result of a special grant. From the medical point of view the factory proved most successful. The experiment of Scio House—a comfortable, "homely" institution for ex-officers suffering from advanced tuberculosis—has proved an unqualified success.

No less important than this continuing war work are the activities of the Red Cross Home Service Ambulance Committee, whose vehicles carry a steadily increasing number of sufferers every year. Modern methods of diagnosis and treatment depend so much on immovable mechanical apparatus that the mobility of the sick is becoming really important. In 1920, each of 273 ambulances carried an average of 125·6 patients. In 1927 the average had increased to 267·7. First-aid boxes are being set up on main roads, and all over the country members of the Order and Society spend their week-ends and holidays on the roads, armed with splints, bandages, and dressings. Considering the fact that 138,774 accidents, involving death or injury, took place on the roads of the United Kingdom in 1926, the Council feels justified in appealing for more voluntary workers for this service. The mobile X ray service is being increasingly used and a second car has been equipped.

THE INTERNATIONAL HANDBOOK OF CHILD CARE AND PROTECTION.[1]

SINCE the first edition of this remarkable book appeared in 1924 200 pages have been added to its bulk and 3*s.* to its price. The somewhat inadequate "International Who's Who" has disappeared, its place being taken by a useful bibliography, and a much fuller index than heretofore enables the inquirer to find more easily the particular information he desires. Mr. Edward Fuller, who has carried out

[1] Third edition. Compiled from official sources by Edward Fuller. London: Longmans, Green and Co., Ltd., and the Weardale Press. 1928. Pp. 646. 10*s.* 6*d.*

the arduous task of compiling a record dealing with 300 countries or political units, excuses himself for inequalities of presentation, pointing out that the details are supplied in various forms and a dozen languages, that some replies are received two years after sending out the questions—though the Governor of Guadeloupe is the only one bold enough to state that his statistics are authoritative for five years—while there is no sort of agreement among English-speaking people as to what they mean by "child welfare." Many surprises are met with in turning over the pages of this volume; for instance, that child welfare work has been carried on in Afghanistan since 1910, that both infant vaccination and education are compulsory in the Bahamas but neither in Barbados, that abortion is legal in Russia, that no less than 2,300,000 children in Germany are cared for by public and private charity, and that the infant mortality-rate in the Republic of Cuba is only 31 per 1000, falling to 20 in the city of Havana. Mr. Fuller says that his purpose is to place his readers "in possession of information which is not available in any other single volume or in any one country (and in many instances not at all outside official documents not always published) leaving each reader to marshal the facts as he will and to make his own comparisons." The book is admirably suited to fulfil this aim.

NITRITES IN SEA-SICKNESS.

Dr. J. F. Pearcy and Dr. D. B. Hayden, of Chicago,[1] believe that sea-sickness is mostly, if not entirely, due to over-stimulation of the vestibule. In studying the effects of blood pressure on labyrinthine function, they found that sodium nitrite, by lowering the blood pressure, markedly diminished nystagmus and past-pointing after rotation. When Dr. Hayden found himself among 16 sea-sick people on an Atlantic boat he naturally tried sodium nitrite. Eight of them were left to suffer and remained ill for an average of two days, despite injections of epinephrine hydrochloride. The eight who took grs. 3–5 of sodium nitrite every two hours were all comfortably eating on deck in an average of four hours, and did not relapse. Dr. A. Sellheim,[2] of Leningrad, has treated 20 cases with a drop of a 1 per cent. solution of nitroglycerine in water or two drops of a ½ per cent. solution on the tongue. All the patients recovered. There seems to be scope for the trial of these methods, but vigorous reduction of blood pressure is not without its dangers, and the nitrites and nitroglycerine are drugs to be handled with considerable caution. If their effect should prove to be mainly psychological some milder vehicle for faith would be preferable.

A HANDY CARD-INDEX CLIP.

Messrs. Cooper, Dennison, and Walkden, Ltd. (7 and 9, St. Bride-street, London, E.C. 4), have sent us specimens of the "transparent" card hinge, invented by Dr. J. M. F. Whitby, to which attention has already been called in our columns. The device consists of two circular discs of transparent linen stitched together down the centre and having their opposing surfaces gummed. They are adapted for use in any card-index cabinet, as one record card can be quickly attached to another which has been filled up, thus making up a book of cards. The salient points about the hinges which are already in use by insurance practitioners and others are their cheapness, ease of manipulation, saving of labour, and readiness to hand. The price is 1*s.* per box of 100, 7*s.* 6*d.* per box of 1000, postage extra.

ANIMALS AND REASON.[3]

Dr. Warden, who is assistant professor of psychology in the Animal Laboratory, Columbia University, has written a brief account of how man throughout the ages has interpreted what he has been able to learn of animal life. The story of science in its larger meaning, he points out, is the story of an unceasing attempt on the part of man to understand his own place in the natural order of things, and he surveys accordingly the facts that have emerged and the opinions that have been expressed along the lines of comparative psychology indicating the rise of this branch of learning to an exact science. Noting that the space made available by the format of the series has only permitted the briefest attempt at an historical survey, his hope is that he may be able to place modern movements in proper historical perspective, and his object is attained. He deals with his subject under five headings, ancient animal lore, the Greek influence, the psychology of the Early and Middle Ages (the period covering the decline of the Roman Empire and the rise of Christianity which terminates with the sixteenth century), the period between the opening of that century and the establishment of Darwinian principles, and, finally, with the experimental methods which have brought comparative psychology to-day into an exact science. He regards Darwin as the founder of modern psychology, inasmuch as when the doctrine of evolution had been generally accepted, "a measure of sanity in interpreting animal behaviour" became apparent, but in a technical closing section—the longest—he shows where experimental methods have conducted the leaders of the science. A very interesting little book.

[1] Jour. Amer. Med. Assoc., 1928, xl., 1193.
[2] Brit. Med. Jour., 1928, i., 244.
[3] Psyche Miniatures. An Outline of Comparative Psychology. By C. J. Warden, Ph.D. London: Kegan Paul, Trench, Trübner and Co., Ltd. 1928. Pp. 147. 2*s.* 6*d.*

NEW PREPARATIONS

Citobaryum.—This preparation is manufactured by H. R. Napp, Ltd., 3 and 4, Clements Inn, Kingsway, London. With the large modern developments of X ray work, the diagnostic meal has become a familiar technical process, while barium sulphate is largely replacing bismuth carbonate as an aid for outlining the alimentary tract. The manufacturers have put the preparation on the market, the insoluble sulphate for X ray diagnosis, in a palatable and convenient form, and it is supplied in packets of 150 g., this quantity being estimated as needed for one examination. Full directions for use are supplied and stress is laid upon the fact that the granular external character of the salt disappears if the directions are followed leaving a meal free from objectionable sedimentation.

Shadoform is a special preparation for the ready production of a liquid barium meal issued by the British Drug Houses, Ltd., Graham-street, City-road, N. 1. Its advantages lie in the ease with which the meal can be prepared—it requires merely to be mixed with water—in the thin cream-like consistency of the meal and the complete absence of lumps or grit, in its palatability and opacity, and in the remarkably long time the solid matter remains in suspension. Shadoform is issued in packages of four sealed boxes, each of which contains the equivalent of 4 oz. of chemically pure sulphate of barium.

SIR MORELL MACKENZIE'S BIRTHPLACE.

To the Editor of THE LANCET.

SIR,—Some of your readers interested in medical history who happen to be in the neighbourhood of Leytonstone, London, may like to glance at the house where Sir Morell Mackenzie was born in July, 1837. The old house, with the worn stone steps and the shop in front, is now empty and dilapidated, and if not shortly pulled down may be painted by a new tenant out of knowledge. The house stands at the corner of Browning-road, Leytonstone, which is a small antiquated road turning off the main road, quite close to the "Green Man" Inn, which is advertised as a stopping place by all the tramcars and buses. In all the obituaries I have read no mention is made of the exact spot. The visitor will find a tablet let into the side of the house about 20 ft. from the ground, which commemorates the fact. I am, Sir, yours faithfully,

London, August 7th, 1928. OBSERVER.

ACTIVE TREATMENT AFTER ELECTRICAL TRAUMA.

ELECTRICAL injuries, perhaps more than any other, call for conservative treatment as a general rule. The reason for this is the tendency of the affected tissues to necrosis and hæmorrhage. Nevertheless, as Prof. S. Jellinek[1] has recently pointed out, active measures are called for by certain definite indications. Rupture of vessels may give trouble in the third or fourth weeks, and however carefully ligatures are applied they are always liable to cut through the altered vascular wall. Cerebral œdema calls for lumbar puncture, an operation which this authority recommends as a first-aid measure in all electrical accidents. Amputation and surgical intervention, usually with the object of removing damaged tissues, should be rigidly avoided except when there is disturbance of the general health and its cause is undoubtedly the local lesion. Prof. Jellinek insists strenuously that the ordinary rules of pathology frequently do not apply here, and that hundreds of these operations are performed unnecessarily. A fourth indication is the division of nerves by wire or metallic edges. Otherwise the more conservative the treatment of electrical injury the better.

[1] Wien. klin. Woch., 1928, i., 766.

CLOSING OF WAR HOSPITALS.—Two of the great Birmingham War Hospitals, Uffculme and Sovrento, were closed last week, being no longer required for their original purpose. From 1919 to 1923 Uffculme was devoted solely to orthopædic and limb cases; since then it has been used for general surgical and medical cases, and as a centre for the supply and repair of artificial limbs. Sovrento, which was used mainly for paraplegic cases, will now become a maternity home under the City Health Committee.